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**ROBERT, LORD ROMNEY,**

*President of the Society Instituted at London,*

*for the Encouragement of Arts, Manufactures, & Commerce.*

*From the Original Picture in the Possession of the Society.*

# TRANSACTIONS

OF THE

# SOCIETY

INSTITUTED AT LONDON,

FOR THE

# ENCOURAGEMENT

OF

# ARTS, MANUFACTURES, and COMMERCE;

WITH THE

PREMIUMS offered in the YEAR 1785.

VOL. III.

---

THE SECOND EDITION.

---

LONDON:

Printed by T. SPILSBURY and SON, Snow-hill.

To be had, by MEMBERS, of the REGISTER, at the SOCIETY'S HOUSE, in the ADELPHI; and sold by Meſſrs. DODSLEY, HOOPER, ROBSON, WHITE, BECKET, JOHNSON, CADELL, ELMSLEY, WALTER, RICHARDSON, DEBRETT, SEWELL, and TAYLOR.

M.DCC.XCII.

# PREFACE.

A GENERAL ſatisfaction has been expreſſed, not only by the Members, but by the Publick at large, at the annual appearance of a Volume of the Tranſactions of this Society; and the utility of ſuch a publication has been fully evinced by the honorable and large increaſe of members elected within the three laſt years; a circumſtance highly pleaſing to every well-wiſher to the Arts, the Manufactures, and Commerce of theſe kingdoms, and which may reaſonably be conſidered as ariſing, in ſome degree, from the circulation of theſe volumes, whereby the nature of the inſtitution has become more generally known, and the whole nation informed of their proceedings, and acquainted with the general utility ariſing from their labours, which are, and, agreeably to the principles of the Society, ever

have been exerted in encouraging and promoting thoſe inventions that tend to the improvement of the uſeful Arts.

The following ſheets will be found to contain, under the head of Agriculture, accounts of planting Timber, eſpecially in the northern part of the iſland, in ſuch great numbers as reflect the higheſt honour on the owner of the ſoil, and will ſerve, it is hoped, to ſtimulate the poſſeſſors of large tracts of barren and uncultivated lands to adopt the ſame practice, by which not only their eſtates will in time become much more valuable, but will in a few years improve in beauty, and render the inhabitants more comfortable and happy; under this head are alſo inſerted ſome judicious obſervations on the culture of different kinds of Wheat, and of the Howard or Cluſtered Potatoe, whoſe great increaſe is well known, and which has been long talked of for feeding Hogs, &c. but no deciſive experiments on the excellency of this

this ſpecies for ſuch purpoſe has till now publicly appeared.

In the claſs of Polite Arts, the account given of the pictures which ornament the room in which the meetings of the Society are held, it is preſumed, will prove entertaining and inſtructive, and ſerve at the ſame time to make known the eminent abilities of the Artiſt who executed them, and prove that the finer Arts ſtill continue objects of the attention and encouragement of the Society. The far greater part of the account now printed, is extracted from a work publiſhed by Mr. Barry, at the time of the exhibitions; but thoſe parts which do not immediately relate to the ſubject of the ſeveral Pictures are omitted, and a ſhort hiſtorical account of the procedings of the Society on the ſubject of the Paintings introduced in its ſtead.

Under the head of Manufactures will appear a Letter on the preparing Cloth from the

the ſtalks or binds of Hops, which was written to the Society many years ſince, in conſequence of a premium then offered on that ſubject. When it is recollected what vaſt quantities of ſtalks or binds of Hops are every year cut down and thrown on dunghills, it ſurely merits the attention of the Society in particular, and of the publick at large, to diſcover if poſſible a mode of applying them advantageouſly to uſe in ſome manufactures of this country; and it has been judged proper to reſtore in another form the premium formerly offered for making cloth from them, in hopes they may be employed in that manner: but if that ſhould fail, the hint given of converting them to uſe, may perhaps lead ingenious men to turn their thoughts to the diſcovery of ſome other purpoſes, to which they may be more adapted.

In the claſs of Mechanicks is inſerted an account and print of a Crane, which, under

under ſome local circumſtance, will certainly be found a very uſeful one. A Lock alſo, of a conſtruction to render it eaſy in opening, and prevent its being out of order, is deſcribed, together with a ſecret eſcutcheon, which, being applied to the covering any deſk, will almoſt infallibly ſecure it from being picked or opened without the knowledge of the owner. And here it may not be amiſs to recommend to the attention of every mechanick the little work entitled, A Century of Inventions, by the Marquis of Worceſter, which, on account of the ſeeming improbability of diſcovering many things mentioned therein, has been too much neglected: but when it is conſidered that ſome of the contrivances, apparently not the leaſt abſtruſe, have by cloſe application been found to anſwer all the Marquis ſays of them, and that the firſt hint of that moſt powerful machine, the Steam-Engine, is given in that work, it is unneceſſary to enlarge on the utility of it.

To

To ſhew the ſeveral parts of the Crane, and the ſecret Eſcutcheon, two plates are inſerted in this volume, executed by Mr. Laurie, whoſe method of printing in colours is deſcribed in the ſecond Volume of the Tranſactions, page 145.

Theſe are ſome of the principal matters in the following volume; and as the communications to the Society promiſe to increaſe, and they are already in the poſſeſſion of ſome papers towards forming a future volume, there is reaſon to believe theſe books will in time make a very valuable addition to every Library.

CON-

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# PAPERS

IN

# AGRICULTURE.

# AGRICULTURE.

IT is univerſally acknowledged, that promoting the growth of trees, is very highly deſerving every approbation in the power of the Society to beſtow; and it is with great ſatisfaction they perceive, that a practice ſo conducive to the benefit of the public, is extending itſelf into thoſe parts of the kingdom, which have long been disfigured by barren and ſandy heaths. This has been eminently ſhewn in Bedfordſhire, where the flouriſhing plantations, made by Francis Moore, Eſq. at Aſpley Guiſe, of which an account is given in the firſt Volume of the Society's Tranſactions, page 129, and thoſe deſcribed in the following letters, cannot fail of being particularly beneficial, whether we conſider the plantations with reſpect to thoſe trees intended to ſtand for

timber, or the underwood as ſupplying fewel to a part of the country where that neceſſary article has hitherto been at ſo high a price.

In the year 1782, the Society were informed a large plantation of wood had been made, by the Right Honourable the Earl of Upper-Oſſory, near Ampthill in Bedfordſhire; and although no application had been made to the Society for any premium offered on that ſubject, yet they judged proper to enquire into the nature and extent of thoſe improvements; and, after receiving the information contained in the following letters, preſented to the Earl of Upper-Oſſory their GOLD MEDAL, as a mark of their approbation of the extenſive plantations made by his Lordſhip near Ampthill.

*Ampthill,*

*Ampthill, Jan.* 14, 1783.

SIR,

THE 24th of December laſt, I was favoured with a letter from Mr. Small, with a requiſition to know the nature, ſize, and condition of Lord Oſſory's plantations, and to tranſmit the ſame to you.—I immediately applied to his Lordſhip for information, who ordered his park gardener to make out the account of the number of acres, &c. which I have here encloſed.

If the Society or yourſelf ſhould want any further information, and will acquaint me with it, I will, with pleaſure, obey their or your commands.

I am, Sir,

Your moſt humble Servant,

L. HUMBERSTONE.

*Mr.* SAMUEL MORE,
*Secretary to the Society*
*for Encouragement of*
*Arts, &c.*

*To* MR. HUMBERSTONE.

*Ampthill Park, Jan.* 12, 1783.

SIR,

THE different plantations of the Earl of Upper-Oſſory, that have lately been planted, conſiſt of about forty-ſix acres, and are planted with about one hundred and eighty-four thouſand trees, that is, four thouſand per acre; all of them are in a very flouriſhing condition. Some of the above are within the park, others on barren ground contiguous to it, and a few acres on one of his Lordſhip's eſtates, a few miles diſtant. The greater part are planted with Scotch Firs, mixed with Foreſt-trees of all kinds, ſuch as Oaks, Beeches, Spaniſh Cheſnuts, Hornbeam, Birch, Sycamore, Lombardy Poplar, Larches, and Spruce Firs; one plantation excepted, which was planted laſt year with

with forty-two thouſand Scotch Firs, and two thouſand Seedling Oaks and Spaniſh Cheſnuts. — The very wet places are planted with Aſh and Alder, with Willows of different kinds intermixed. The age of the Scotch Firs, at the time of planting, is three years; that is, one year in the ſeed-bed, and two in tranſplanted rows. The deciduous are from four to ſeven years old. There are alſo upwards of twenty acres planted, ſome years ago, with Scotch and Spruce Firs, Beech, and Spaniſh Cheſnuts. All his Lordſhip's plantations are well ſecured from cattle, and, while young, from hares and rabbits. There will be a great number planted this year; and as his Lordſhip intends planting every ſeaſon, they will ſoon be increaſed to a very large extent. As his Lordſhip's ſucceſs in planting is remarkably great, not having ten out of a thouſand die: if the Society wiſhes for any information relating either to raiſing or planting, or the growth of

the different trees on the various ſoils on which they are planted, I ſhall be willing to communicate to them ſuch circumſtances as may be required.

ROBERT GIBBS.

Mr. SAMUEL MORE.

---

*Ampthill Park, Dec.* 22, 1783.

SIR,

I HOPE I ſhall be readily excuſed for not writing to you ſooner, when I acquaint you that my only motive was to make ſome further obſervations on what I had planted. As I would not willingly impoſe on any private perſon, ſo I would cautiouſly guard againſt impoſitions on a Society

Society intended for public good. In my laſt letter I gave ſome account of the extent of his Lordſhip's plantations, with the number of plants, and the various ſorts they were planted with. This year I have almoſt finiſhed another plantation of about fourteen acres, planted with much the ſame kinds as the former. The ſoil in general is dry, barren, ſandy, and heathy, a few acres excepted, which are loamy, and a ſmall quantity is very wet. Spaniſh Cheſnuts, Birch, Scotch Firs, Larches, and Weymouth Pines, thrive exceedingly well on the dry and barren ſand; as alſo do the Spruce Firs for a few years, as eighteen or twenty; after this time they begin to die at the top; ſo that we have been obliged to cut vaſt numbers down before they were of any ſize or uſe, other than for ſpars and rails for fencing. On the loamy ſoil they ſtill continue vigorous in their growth, and beautiful in appearance. I think the great ſucceſs I have had in planting for his Lordſhip (and I believe

believe it will hold good in all other plantations) is the care of the plants in the ſeed-beds and nurſery-rows, to keep them clean, and not too cloſe together, to draw one another up. The Scotch Fir I plant out of the ſeed-bed, at one year old, into beds of four feet wide, and ſix or eight inches aſunder: in theſe beds they ſtand two years, which I find to be the beſt age to enſure ſucceſs; when ſmaller, the weeds are apt to injure them; when larger, they have very few fibres, and are more hurt by the winds, and longer before they ſtrike out freſh roots, and often are killed by the dry weather before they get hold of the ground. When I take them up, I ſecure as much of the earth about them as will hang; putting them carefully into whatever carriage they are conveyed in, and uſing the ſame care in laying them in their places where they are to be planted, which are holes eighteen inches diameter, putting the beſt mould about their roots. The

Spruce

Spruce Fir, and the Weymouth Pine, I order in the ſame manner; with this difference only, that they will bear to ſtand longer, two, three, or four years, before they are planted out, and at that age plenty of mould will hang to their roots, which is of eſſential ſervice to plants in general. I alſo manage the deciduous trees in much the ſame manner. I have planted ſome Lombardy Poplars in a poor ſandy ſoil, which do very well, but thrive much better in a moiſt loam, on which I planted ſome about ſeventeen years ago, and they are now near ſixty feet high; but in a very wet ground I cannot get them to grow at all: whereas Aſh and Alder grow in ſuch land amazingly quick. Oaks grow very faſt among Birches and Firs, which I call nurſing-plants to them: ſome of thoſe I thus planted about ten years ago, are now ſixteen feet high. I think they will not make good timber on ſo poor a ſoil, but will produce underwood, if cut down

down in time; or, if they are ſuffered to remain, may anſwer ordinary purpoſes, and will ſave the better timber for extraordinary uſes. Early planting is by far the beſt for dry ſoils: I generally finiſh the greater part of both evergreen and deciduous, about the end of January.

If there is any other information wanted by the Society, that I have omitted, and is in my power to give, let me know, and I will ſend an anſwer by the return of poſt.

I am, &c.

ROBERT GIBBS.

Mr. SAMUEL MORE.

THE

THE thanks of the Society were ordered to George Roſs, Eſq. for the following communication. He was requeſted hereafter to favour the Society with an account of the ſucceſs which may attend his plantation; and the GOLD MEDAL was preſented to him as a mark of the Society's approbation of his ſpirited attention to the planting Oaks, and other Foreſt-trees, in Scotland.

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*Conduit-ſtreet, May* 19, 1784.

SIR,

WHEN a proper opportunity offers, you will be pleaſed to lay the encloſed certificate before the Honourable Society to which you are Secretary: it will ſhew them

them we are not altogether idle in the northern parts of Scotland.

About eighteen years ago, when I purchaſed the eſtate of Cromarty, ſurrounded by the famous bay of that name, I found upwards of four hundred acres of full grown Scotch Firs, and among them ſeveral Oak and other Foreſt trees, which led me to introduce Oak-plants, by cutting out the Firs, leaving a certain quantity for ſhelter to the Oaks; which fully anſwers my expectation, and will, I flatter myſelf, be followed by my neighbours; and, in proceſs of time, muſt prove a public benefit, eſpecially in a country ſurrounded by the famous bay which the ancients called *Portus Salutis*.

I obſerve, from laſt year's publication, you have had no correſpondents in North Britain; but I conclude no diſtinction is made between South and North Britain; and you will obſerve that ſix volumes have been lately publiſhed in the name of a Mr. Wight, who ſurveyed the country by

by order of the Commiſſioners of annexed eſtates, which are not unworthy of your peruſal.

I am, Sir,

Your moſt obedient,

humble Servant,

GEORGE ROSS.

*Mr.* SAMUEL MORE.

---

*Richmond, Surry, Nov.* 11, 1784.

SIR,

IN anſwer to your letter of the 9th, deſiring to be informed, for the information

tion of the Committee, of the preſent ſtate of my young plantations at Cromarty, you will be pleaſed to know, that though I have not been there myſelf this ſummer, my nephew, Mr. Gray, has, who reports that they are all in a very thriving condition, barring ſome that in ſo extenſive a plantation have failed, for the renewal of which, orders have been given.

With reſpect to the account you deſire of the age and ſize of the Firs and Oaks I found upon the eſtate when I made the purchaſe, I beg leave to acquaint you that I found a large plantation, conſiſting of four hundred acres, ſituated on the peninſula of that eſtate, of the age of thirty years; and in cutting roads and walks through this plantation, ſeveral Oaks, Aſh, and Elms, intermixed, and ſtruggling in growth with the Firs, which ſatisfied me that the ſoil would produce ſuch trees; and therefore I proceeded in cutting down ſome of the firs, and planting

ing from my nurſeries, from time to time, Oak, Aſh, and Elm, under the ſhelter of the Firs left ſtanding; and by that means, in proceſs of time, that plantation will become a foreſt of uſeful timber.

I am, Sir,

Your moſt obedient and

moſt humble ſervant,

GEORGE ROSS.

Mr. SAMUEL MORE.

By the certificate mentioned in the firſt letter from Mr. Roſs, ſigned George Bavin, gardener, and atteſted by Mr. Walter Roſs, it appears that there were planted, on the eſtate of George Roſs, Eſq. at Cromarty, in North Britain, from the month of March, 1783, to the month of

May, 1784, on ground well fenced, the following trees, viz.

OAKS.—Ninety thouſand three hundred.

ELMS.—Thirty-one thouſand two hundred.

ASH.—Forty-two thouſand.

BEECH.—Thirteen thouſand two hundred.

SYCAMORE.—Two thouſand one hundred.

CHESNUT.—Four thouſand.

LARCH.—One thouſand nine hundred.

SCOTCH FIRS.—Three millions five thouſand.

Total.—Three millions, one hundred, eighty-nine thouſand, ſeven hundred trees.

## CULTURE OF WHEAT.

THE thanks of the Society were ordered to Mr. Boys, of Betſhanger, in Kent, for the following communications reſpecting his experiments on the culture of different kinds of Wheat.

*Betſhanger, Feb.* 10, 1783.

SIR,

IN order to aſcertain what ſort of Wheat is moſt advantageous to be cultivated on a good dry loamy ſoil, I have made two experiments, which were purely for my own information; but ſeeing they may tend to the public advantage by being made known, and having been encouraged by you, when I had the honour of waiting on

you in town, to communicate any thing I might have to offer, have encloſed an account of them, and requeſt the favour of you, if you think them of ſufficient importance, to lay them before the Honourable Society for the Encouragement of Arts, Manufactures, and Commerce.

I am, Sir,

Yours, reſpectfully,

J. Boys.

Mr. Samuel More.

In the autumn of 1776, I ſowed five half acres with different ſorts of Wheat on a clover lay, in the middle of a field of fourteen acres, which was quite on a level,

level, and the ſoil exactly the ſame, all ſowed in one day, and managed preciſely in the ſame manner, and laid ſeparately in the barn, and carefully threſhed and meaſured.

In the autumn of 1781, the ſame field being to be ſown with Wheat, to prove whether a different ſeaſon and different tilth, it being this time a bean ſtubble, might make much difference; not having any yellow Lammas Wheat, I meaſured out four half-acres about the ſame place, and went on the ſame as before with the other four ſorts: the accounts of each as follows.

| Date. | Sorts of Wheat. | Produce per half Acre. Quar. | Bush. | Gall. | Produce per Acre. Quar. | Bush. | Gall. | Value per Quar. s. | d. | Value per Acre. £. | s. | d. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1777. | Hoary White | 1 | 6 | 1½ | 3 | 4 | 3 | 45 | | 7 | 19 | 7 |
| | Fulham | 1 | 6 | 1 | 3 | 4 | 2 | 41 | | 7 | 4 | 9¼ |
| | White Straw | 1 | 6 | 0 | 3 | 4 | 0 | 43 | | 7 | 10 | 6 |
| | Yellow Lammas | 1 | 4 | 0 | 3 | 0 | 0 | 44 | | 6 | 12 | 0 |
| | Brown Lammas | 1 | 3 | 6 | 2 | 7 | 4 | 44 | | 6 | 9 | 3 |
| 1782. | Hoary White | 2 | 6 | 2 | 5 | 4 | 4 | 52 | 6 | 14 | 12 | 0¼ |
| | Fulham | 2 | 6 | 0 | 5 | 4 | 0 | 48 | | 13 | 4 | 0 |
| | White Straw | 2 | 6 | 0 | 5 | 4 | 0 | 50 | | 13 | 15 | 0 |
| | Brown Lammas | 2 | 3 | 0 | 4 | 6 | 0 | 51 | | 12 | 2 | 3 |

The prices annexed were the value of the different ſorts as the markets were at the time of threſhing, according to the beſt of my judgment. The buſhel contains eight gallons and one quart.

The crop laſt year was the moſt abundant I ever knew, which was owing to the wet ſummer, as that ſuits our dry ſoils very well: the produce in general is about three and a half quarters per acre.

It appears by theſe experiments, that the Hoary White is the beſt to cultivate on ſuch ſoil, and very far ſuperior to the common Brown Lammas, which I believe is the ſort moſt generally ſown.

The Fulham produces about the ſame crop, but being a very coarſe Wheat with a thick bran, is of very inferior value. There is another ſort of white Wheat, which is by ſome cultivated in this neighbourhood, called the Egg-ſhell White, which I did not try, having a particular averſion to that ſort, on account of its being ſo free in the ear as to drop out in the

field, which would not ſuit our hills, that are much expoſed to high winds: it is a ſort much eſteemed by the Millers. If experiments of this kind are acceptable to the Honourable Society, you will probably hear further from

Your humble ſervant,

J. Boys.

Mr. Samuel More.

Dibbling

## DIBBLING WHEAT.

THANKS were returned to Mr. Wagſtaffe, the writer of the following letter, for the information contained therein reſpecting the mode of dibbling Wheat, as practiſed in Norfolk: and in conſequence of the intimation therein given by him, a premium was offered for communicating to the Society the beſt ſet of experiments to aſcertain the merits of that practice in the culture of Wheat when compared with ſowing it in broad-caſt, or drilling it in equidiſtant rows.

*To the Society for the Encouragement of Arts, Manufactures, and Commerce.*

*Norwich, Oct. 27, 1783.*

GENTLEMEN,

I TAKE the liberty to addreſs you on a ſubject I conceive will be worthy your patronage, viz. the dibbling or dropping of Wheat, which, though prevailing in this part of the nation, ſeems little underſtood, or ſcarcely apprehended, in the ſouthern, north-weſt, and midland counties.

Your encouragement hath been handed forth during ſome years, for the beſt ſet of experiments to aſcertain whether it is moſt advantageous to cultivate Wheat by ſowing it in the common broad-caſt way, or by drilling it in equidiſtant rows. Whether

ther you have had this comparative difference aſcertained, is not neceſſary for me to enquire; my purpoſe is a wiſh that, in handing forth a future encouragement, you might ſee it eligible to connect this late mode of propagation with the two former: I have been long perſuaded it is ſuperior to either, and that, purſued on lands of a certain deſcription, it will be productive of much national advantage, and with no hazard of comparative loſs applied to any lands, experimentally known to be ſuitable to this grain.

I ſhall therefore beg leave to mention, having with you the good of the public in object, that being connected by neighbourhood, or buſineſs, with divers farmers, ſetters of Wheat, and having tried it myſelf upon a ſmall ſcale, yet the largeſt I was capable of, and been a cloſe obſerver, from its beginning, through its ſucceſſive adoptions in the part of the country where it began; I therefore hold myſelf

myſelf ready to communicate any intelligence to you, that may tend to your forming a ſuitable judgment thereon, and as a ground for your future encouragement.

I may likewiſe add, though perhaps prematurely, that as the practice is novel, and in ſpeculation unpromiſing, and has been conſidered as a refinement by genius, at a diſtance, I conceive it would be in my power, upon your compenſation for time and travelling, at a future ſeed-time, to excite a dibbler, with one or two of his droppers, to go to any place within fifty miles of London.

This, I preſume, would impreſs an adequate idea of its mode, make the practice eaſy to their imitators, and in due time give an evidence which ſpeculation is ſcarce capable of attaining, that the œconomy of ſeed tends to an increaſe ſomewhat proportionable to the houghing up nine tenths of a Turnep crop, which experience has evinced augments their

their real produce: yet in the ſetting of Wheat, as in the thinning of Turneps, it muſt be under a regulation, and preciſion of judgment, which nevertheleſs practice can render eaſy, and an intelligent obſerver ſoon acquire.

I am, with great attention,

Your reſpectful Friend,

JOHN WAGSTAFFE.

P. S. I can ſcarce refrain obſerving that this preſent ſeed-time more Wheat hath been ſet and land reſerved for its continuance, within the diſtance of ten miles from Norwich, than in any preceding year, and peculiarly ſo in the hundred where it originated, while it is diffuſing (though ſlowly) in every direction, and is now extended into a neighbouring county.

HOWARD

## HOWARD, OR CLUSTERED POTATOE.

IN the year 1779, the Silver Medal of the Society was voted to Arthur Young, Eſq. of Bradfield Hall, near Bury, Suffolk, for the following account of the culture, produce, and application of the Howard or Cluſtered Potatoe.

From the general tenor of the premiums offered by the Society, relative to the Howard Potatoe, I apprehend they wiſh information not only in the mode of cultivating it, but the quantity of the produce, and the uſes in feeding cattle, as they have at different times offered three diſtinct premiums for theſe objects. My experiments on either of the three, ſeparately taken, might not be worthy of their attention; I ſhall therefore blend them into one account, though I, by ſo doing, ſhall hazard that ſtrict compliance with

with their conditions which they may require; and I ſhall venture this the rather, as I ſhould otherwiſe be a candidate for three medals inſtead of one.

## EXPERIMENT I.

PRODUCTIVE QUALITY. April 4, 1770. Having a ſmall Howard Potatoe, cut it into four ſets, planted them on a hillock of ſandy loam, ſcattered with two pecks of poultry dung; when they came up, earthed them with one peck of chalk, and ſoon after with two pecks of rotten yard dung, again with one peck of poultry dung, and a layer of loam. I was abſent a conſiderable part of the ſummer, and therefore could not mark the progreſs of the vegetation, whether checked or accelerated by theſe earthings. Dug them up in November 16; the produce, ninety Potatoes, meaſuring two

two pecks, ſome of them remarkaby fine, weight thirty-one pound; the quantity of land occupied, four ſquare feet; the acreable produce, one thouſand three hundred and ſixty-one buſhels.

## EXPERIMENT II.

COMPARISON WITH OTHER SORTS. March 20, 1771. Manured three furrows of ridges, four feet and a half broad, and ſeventy yards long, with ſix loads of farm-yard dung; the ſoil, a wet hungry gravel, naturally poor. In 1770, it was manured ſeventy loads an acre, of earth and dung, drilled with Lucerne; but, failing, it was ſummer-fallowed for Turneps, but not ſown. Through a ſervant's miſtake, the dung for the Potatoes was laid in the furrows, and the ſets upon it in a double row, twelve inches apart, and as much from ſet to ſet; one

buſhel

buſhel of ſeed. Covered them by reverſing the ridges with a plough; alſo five ridges contiguous, dunged in the ſame manner, with two buſhels and half a peck of Red-noſe Kidney, ſuppoſed, at London, to be the moſt prolific ſort; alſo two other ridges, dunged in the ſame manner, with five pecks, a mixture of Golden Tags, and Golden Ruſſets from Lancaſhire.

The firſt week in June, hand-hoed the rows; the middle of the ſame month, horſe-hoed the intervals with a Berkſhire ſhim, which cuts the ſurface, but turns no furrow; followed this with a large double mould-board plough, which earthed up the rows, clearing the furrows, and leaving the land in beautiful order.

July 12, hand-weeded the rows; the middle of Auguſt, repeated the ſhimming and double mould-board plough; the firſt week in September, hand-weeded; the latter end of October, ploughed them up.

| Produce. | *Bushels.* |
|---|---|
| Three ridges of Howards | 24 |
| Five ditto Red N. Kidney | 16 |
| Two ditto Tags and Russets | 9 |

| Which, per acre, makes | *Bushels.* |
|---|---|
| Howards | 360 |
| Kidneys | 144 |
| Tags and Russets | 207 |

*Account of the Howards per acre.*

| | Expences. | | | £. | s. | d. |
|---|---|---|---|---|---|---|
| 1770. | Four ploughings, at 6s. | | | 1 | 4 | 0 |
| | Three harrowings, at 9d. | | | 0 | 2 | 3 |
| | Seventy loads of compost, at 2s. | | | 7 | 0 | 0 |
| | Rent | 0 | 8 0 | | | |
| | Rates | 0 | 1 2 | | | |
| | Repairs* | 0 | 1 0 | | | |
| | Fences* | 0 | 1 6 | | | |
| | | | | 0 | 11 | 8 |
| | Carried over | | | 8 | 17 | 11 |

* This upon an average per annum, over the whole farm.

| | | £. | s. | d. |
|---|---|---|---|---|
| | Brought over | 8 | 17 | 11 |
| 1771. | One ploughing | 0 | 6 | 0 |
| | Eighty-nine loads of compoſt, at 2s. | 8 | 18 | 0 |
| | Eighteen buſhels, ſets 2s. | 1 | 16 | 0 |
| | Planting | 0 | 6 | 0 |
| | Harrowing | 0 | 0 | 9 |
| | Hand-hoeing | 0 | 2 | 6 |
| | Shimming | 0 | 0 | 9 |
| | Moulding Plough | 0 | 5 | 9 |
| | Weeding | 0 | 1 | 6 |
| | Horſe-hoeing repeated | 0 | 5 | 9 |
| | Weeding | 0 | 3 | 0 |
| | Ploughing and picking | 1 | 6 | 0 |
| | Annual charges as before | 0 | 11 | 8 |
| | | 23 | 0 | 10 |

| Produce. | £. | s. | d. |
|---|---|---|---|
| Three hundred and ſixty buſhels, two ſhillings the ſelling price, but ſuppoſe 1s. 6d. the price of common Potatoes | 27 | 0 | 0 |
| Expences - | 23 | 0 | 10 |
| Profit | 3 | 19 | 2 |

*Account of the Kidneys.*

| Produce. | £. | s. | d. |
|---|---|---|---|
| One hundred and forty-four buſhels, at 1s. 6d. | 10 | 16 | 0 |
| Expences, the ſame, the ſmall variation in the ſeed not worth noting | 23 | 0 | 10 |
| Loſs - - - - - | 12 | 4 | 10 |

*Account of the Tags and Ruſſets.*

| Produce. | | | |
|---|---|---|---|
| Two hundred and ſeven buſhels, at 1s. 6d. - | 15 | 10 | 6 |
| Expences - - - - - - | 23 | 0 | 10 |
| Loſs - - - - - - - | 7 | 10 | 4 |

OBSER-

OBSERVATIONS.

The ſoil above deſcribed is perhaps the moſt unfit of all others for common Potatoes; but being informed that the Howard would thrive where other ſorts would not, I purpoſely choſe it. The event is remarkable, and proves clearly that on theſe wet tenacious gravels, great crops of that ſort may be gained: the unſatisfactory circumſtance is, the value of the crop; a circumſtance general with Potatoes, for their price varies exceedingly, and what is worſe, have ſometimes no price at all for large quantities; conſequently, if they cannot be conſumed at home by cattle profitably, the object is not an important one. Two manurings being charged to one crop, render the expence very high. It muſt however ſtrike every perſon, that, had the Potatoes no more than paid the expence, the return would have been prodigiouſly advantageous,

as the land is left in uncommon order for ſucceeding crops.

It is neceſſary here to remark, that the value of two ſhillings a load for the manure is for a one-horſe three-wheel carriage or cart, which holds about eighteen buſhels, and is the average expence of my farm-yard compoſt for ſeveral years paſt. In the ſummer I cart a layer of marle, turf, or mould, over all my yard; and in the following winter fodder my cattle on it, cleaning the ſtables, cow-houſe, and hog-ſtyes on to it, bones, night ſoil, coal-aſhes, ſullage of ſtreets, or whatever manure I buy. In the ſpring I turn the whole over, mixing well together, and cart it for Potatoes. The two ſhillings includes filling, ſpreading, carting, and in a word, all expence whatever.

### EXPERIMENT III.

In ploughing up the preceding crop, two lands were thrown into one, and early

early in the ſpring ſplit again; after which one of them, where the Howards had been, coming up tolerably thick, from the ſmall Potatoes left, I deſiſted from ploughing it up, in order to ſee what the reſult would be: it was hand-hoed once, and weeded twice; and being taken up in November, 1772, the produce was ſix buſhels, or per acre two hundred and ſeventy-ſix, which, at one ſhilling and ſixpence, is twenty pounds fourteen ſhillings.

## EXPERIMENT IV.

CULTURE, EXPENCES, PRODUCE, AND APPLICATION OF ONE HUNDRED AND TWENTY PERCH. 1772. The ſoil, a deep ſandy loam; it was under Carrots in 1771, and ploughed flat in autumn: the extreme wetneſs of the ſpring prevented my carting on the dung till the ſixth of April, and then only thirty loads. Rain

coming the eighth, prevented going on with it. Spread the compoſt; and on the thirteenth ploughed it into four feet ridges, ſtriking the furrows immediately with the double mould-board plough: at the ſame time drew furrows at four feet diſtance, as paths for that large plough to open trenches to lay the dung in, that I might ſee which method anſwered beſt, ſpreading the manure all over the land, or laying it in furrows under the crop; but heavy rains impeded the work. The fourteenth it rained from five in the morning till ten at night, a cruel ſeaſon for Potatoe-planting: the piece ploughed the thirteenth did not work ſo well as it ought; indeed the ſeaſon had been ſo wet, that no land except lays ploughed tolerably. April twenty-ſecond and twenty-third went on with the manuring; and the twenty-ninth, planted part, laying the ſets in double rows, at one foot, on the dung, and covered them immediately with the plough, reverſing the ridges: the

part

part ploughed, with deſign to dibble, baked too hard for it; ploughed it therefore again, planting it in ſingle rows: the plough firſt turned a furrow from one ſide of each ridge, and upon the back of this furrow the ſets were laid, ſix inches apart; the plough then returning, and taking a ſimilar furrow from the oppoſite ridge, covered the ſets, which muſt of courſe come up in the middle of the new ridge. The dung which was ſpread over the land fell on to the ſets in ploughing, as I could wiſh. May firſt, finiſhed, and, the fourth, planted it; during the ſummer, hand-hoed once, hand-weeded once, and horſe-hoed twice, once with ſhim, and once with double mould-board. Nothing made a more beautiful appearance than theſe potatoes throughout the ſeaſon: the verdure and luxuriance of the herbage, notwithſtanding the ſeverity of the drought which followed that wet ſpring, was a moſt pleaſing ſight; nor was there to be ſeen a weed throughout. November fourteenth,

began

began taking them up. Eighteen rows and a half planted on the dung, one hundred and ten yards long by four feet broad, produced two hundred and thirteen buſhels, dirty: that ſpace makes ninety ſquare perch: the proportion per acre is, three hundred and fourteen boſhels, deducting one ſixth for dirt. Six rows, where the dung was ſpread, produced ſixty-four buſhels and a half dirty, clean fifty-three, one ſixth deducted: proportion per acre, two hundred and ninety-two. Total produce, dirty, two hundred and ſeventy-ſeven buſhels. For ſecuring them during the winter, I ſpread the floor of a ſmall barn with truſſes of ſtraw, cloſe to each other, and the ſame around the ſides of the barn; the Potatoes were laid in with all the dirt that ſtuck to them; ſome were very wet. I did not open the heap till the end of January, when the whole was one hard dry maſs, and the Potatoes very ſound and good; upon meaſuring them clean, the produce was two hundred and forty-

ſix

ſix buſhels: the dirt therefore did not amount quite to one ſixth. One hundred and twenty perch producing two hundred and forty-ſix, is at the rate of three hundred and twenty-eight per acre.

Expences per acre.

| | | £. | s. | d. |
|---|---|---|---|---|
| 1771. | Ploughing - - | 0 | 6 | 0 |
| 1772. | Compoſt, one hundred loads, at 2s. - | 10 | 0 | 0 |
| | Ploughing - - | 0 | 6 | 0 |
| | Twelve buſhels, ſets at 1s. 6d. - | 0 | 18 | 0 |
| | Slicing and Planting | 0 | 6 | 0 |
| | Harrowing - - | 0 | 0 | 9 |
| | Hand-hoeing - - | 0 | 10 | 0 |
| | Hand-weeding - | 0 | 3 | 0 |
| | Horſe-hoeing ſhim | 0 | 0 | 9 |
| | Double mould-board | 0 | 5 | 0 |
| | Ploughing up - | 0 | 6 | 0 |
| Carried over - - - | | 13 | 1 | 6 |

| | £. | s. | d. |
|---|---|---|---|
| Brought over | 13 | 1 | 6 |
| Picking up, 1¼d. per buſh. | 1 | 14 | 2 |
| Carting home, drawing over, and cleaning | 1 | 0 | 0 |
| Annual charges - | 0 | 11 | 8 |
| Value aſcertained | 16 | 7 | 4 |

February the eighth, &c. In a copper that held ſix buſhels, boiled at ſeveral times ſeventy-five buſhels, with ninety buſh-faggots, turning them out of the copper into a tub, wherein they were maſhed: from this tub, put the maſh without any liquor into a ciſtern; adding, as it was done, nine buſhels of barley in meal: a boy in the ciſtern mixed them well together with a ſpade. Bought five Hogs of the Chineſe breed, and weighed them alive.

| | | |
|---|---|---|
| No. 1 | — | 121 *lb.* |
| 2 | — | 117 |
| 3 | — | 102 |
| 4 | — | 95 |
| 5 | — | 98 |
| | | 533 |

They

They coſt ſix pounds, thirteen ſhillings, and three-pence, which is threepence per pound alive. Upon finiſhing the Potatoes, they were weighed alive, killed, and ſold; which was rather a diſadvantage, as none of them were quite fat. I did it however for the ſake of gaining the knowledge I made the trial in ſearch of. They weighed ſeven hundred and eighty-four pounds alive, and five hundred and ten pounds dead, which ſold at ſix-pence per pound, or twelve pounds, fifteen ſhillings: this proportion is nearly twenty pounds alive, giving thirteen dead. N^os 1 and 2 were weighed at different times, and gained, the firſt three weeks of fatting, two pounds and a quarter each, per diem, which is very conſiderable. The expences were,

| | £. | s. | d. |
|---|---|---|---|
| Coſt of the Hogs - - | 6 | 13 | 3 |
| Labour, waſhing Potatoes, and boiling - - - | 0 | 6 | 0 |
| Ninety buſh-faggots, value | 0 | 5 | 0 |
| Nine buſhels Barley - | 1 | 16 | 0 |
| | 9 | 0 | 3 |

| Produce. | £. | s. | d. |
|---|---|---|---|
| Sold at - - - | 12 | 15 | 0 |
| Deduct - - - | 9 | 0 | 3 |
| Remains, which is the value paid for the Potatoes - | 3 | 15 | 9 |

Or per buſhel, one ſhilling.

When I found the hogs thriving ſo well, I expected the Potatoes to pay a higher value than this; not but a ſhilling a buſhel in an application that goes to any quantity, is a great object.

But

But as the prices of Pork and Barley may vary, I ſhall give the product of Pork yielded by this quantity of food.

| | lb. |
|---|---|
| The Hogs, when killed fat, weighed | 510 |
| At putting up, they weighed alive 533lb. This would have been, dead, at 13 for 20 - - - | 346 |
| The gain of Pork was therefore - | 164 |

Thus ſeventy-five buſhels of Potatoes, and nine of Barley, yielded one hundred and ſixty-four pounds of Pork: this is a fact which may be uſeful, whatever the price of Barley is, and for whatever Pork may ſell.

The mere increaſe of dead weight is not the whole profit, or it would not pay the expence: there is, beſides, the profit on converting lean to fat, if bought at three-pence alive weight; but three hundred and forty-ſix dead, at ſix-pence, would be eight pounds, thirteen ſhillings;

ſhillings; whereas they coſt but ſix pounds thirteen ſhillings.

The Society will obſerve, that this value of one ſhilling per buſhel, is found only from one experiment, which though it anſwers for fixing the amount of this crop, yet repeated ones muſt be made to diſcover what may be reckoned a ſtandard value.

| Produce. | £. | s. | d. |
|---|---|---|---|
| Three hundred and twenty-eight buſhels, at 1s. - | 16 | 8 | 0 |
| Expences - - - | 16 | 7 | 4 |

Hence therefore the crop paid the expences; which, conſidering the ample manuring and the great order the land is left in, muſt be eſteemed a very conſiderable profit. The great object of tillage is to find a fallow crop which will pay its expences, manuring included. Every farmer knows that Turneps, under the laſt perfection of culture, will never do this; but if Potatoes uſed at home can be made to do it, every beneficial purpoſe is anſwered; for the con-

conſumption by fattening Hogs raiſes a large quantity of valuable dung.

## EXPERIMENT V.

CULTURE, EXPENCES, PRODUCE, AND APPLICATION OF FOUR ACRES. 1773. This field was at the end of its courſe, and now ready for a fallow. I determined to make Potatoes the fallow, having from the experience of the preceeding trials, among ſome others I had formed, been convinced of their importance. The ſoil, a poor gravelly loam, but not ſo wet, tenacious, or ſo bad as that mentioned in Experiment 11. It was an oat ſtubble on broad flat lands: theſe were ploughed into the four-feet ridge the beginning of November, 1772, and ſo left for winter.

April the fourteenth, 1773, ploughed it again, reverſing the ridges, and immediately on this ploughing carted two hundred and eighty-three loads of farm-yard

compoſt, made the preceding winter, which was ready turned over and mixed for the purpoſe, into the furrows, and planted the ſets in one row, twelve inches aſunder, along the middle of the dung. It took ſeven buſhels an acre: this by women and children, and I found they did it very quick; a plough followed, which, taking off a ſlice from the ſides of each ridge, covered the Potatoes and the dung. As in ſeveral parts of the field I found much graſs and weeds, I did not complete the operation of reverſing the ridges then, that the ſun might have the more power on the land; but did the ſecond bout in a fortnight after, which left the ridges in their firſt form.

The eighteenth and nineteenth of June the plants being about ſix inches high, I turned a furrow from the ſides of each ridge, leaving the plants upon a ſlip of a foot wide. This part of the horſe-hoeing ſyſtem I thought neceſſary before the hand-hoes went to work; for it

turns

turns every large knot of graſs and weeds from the plants into the middle of the intervals, where they are much eaſier deſtroyed, and it leaves the plants far eaſier to hoe. Upon this they were hand-hoed at two ſhillings and ſix-pence per acre; but being a hard job, the men had eleven ſhillings. July the firſt, harrowed the intervals flat with the horſe-hoe harrow, ſome parts of the field twice and thrice in a place, to tear the graſs in pieces, which it did ſo effectually, breaking the clods at the ſame time, that the ſun killed much of the rubbiſh.

July the fifth, began a ſecond hand-hoeing: as this was the laſt they could have, and every little weed to be eradicated, I had it done by the drag. As ſoon as the weeds of this hoeing were dead, began to earth up the rows with the double mould-board plough.

Auguſt twentieth, &c. hand-weeded them; October thirteenth, began to take them up, and finiſhed the twenty-third. I

had the ſtalks pulled up, and carted to the yard for dung, and then ploughed two ridges into one; and men with three-pronged forks followed, who broke the furrows in pieces, each attended by a boy or girl, with a baſket to pick up the Potatoes, and carry them to three-wheeled carts that ſtood ready to receive them. The weather proved very fine, which is an article of great conſequence in taking up Potatoes. The crop was one thouſand five hundred and ſixty-two buſhels; the expence in labour of taking up, five pounds and one penny, or three farthings per buſhel: and four horſes per day, added, at ſeven ſhillings and ſix-pence, is three pounds fifteen ſhillings: in all, eight pounds, fifteen ſhillings, and one penny; which is five farthings per buſhel, a ploughing to the land included. The crop is, per acre, three hundred and ninety buſhels; and they were quite clean, a circumſtance much depending on the dryneſs of the ſeaſon when taken up. I

packed

I packed them into a barn, in the ſame manner as deſcribed before.

| | Expences. | £. | s. | d. |
|---|---|---|---|---|
| 1772. | Ploughing, at 6s. - | 1 | 4 | 0 |
| 1773. | April ditto - - | 1 | 4 | 0 |
| | Two hundred and eighty three loads of compoſt, at 2s - - | 28 | 6 | 0 |
| | Twenty-eight buſhels of ſets, at 1s. - - | 1 | 8 | 0 |
| | Planting and ſlicing | 0 | 13 | 0 |
| | Ploughing to cover | 1 | 4 | 0 |
| | Harrowing at 9d. - | 0 | 3 | 0 |
| | Slicing the ridges with plough, at 3s - | 0 | 12 | 0 |
| | Hand-hoeing - | 0 | 11 | 0 |
| | Horſe-hoeing - - - | 0 | 4 | 6 |
| | Second hand-hoeing | 0 | 8 | 0 |
| | Horſe-hoeing double mould-board plough, at 5s. - - | 1 | 0 | 0 |
| | Carried over - - - | 36 | 17 | 6 |

| | £. | s. | d. |
|---|---|---|---|
| Brought over | 36 | 17 | 6 |
| Hand-weeding - | 0 | 10 | 0 |
| Taking up and carting home - - - | 8 | 15 | 1 |
| Annual expences 11s. 8d. | 2 | 6 | 8 |
| Value aſcertained - | 48 | 9 | 3 |

November the ninth, I began to waſh Potatoes in order for boiling: this is an operation of ſome trouble, eſpecially with the cluſtered ſort; if it is not well done, the dirt ſinks to the bottom of the copper, and ſticks there till it burns. The ſeventeenth, began and boiled two hundred and ſixty buſhels: the expence of fuel was one penny per buſhel; waſhing, one penny; and labour boiling, a halfpenny. With the maſhed Potatoes in the manner before deſcribed, thirty-three buſhels of Barley-meal were mixed: ſix, four, and five Hogs were ſucceſſively put to this meat, their weight alive as follows.

No. 1

| | | lb. |
|---|---|---|
| No. 1 | — | 134 |
| 2 | — | 120 |
| 3 | — | 100 |
| 4 | — | 140 |
| 5 | — | 122 |
| 6 | — | 116 |
| 7 | — | 112 |
| 8 | — | 118 |
| 9 | — | 124 |
| 10 | — | 126 |
| 11 | — | 126 |
| 12 | — | 128 |
| 13 | — | 96 |
| 14 | — | 102 |
| 15 | — | 94 |
| | | 1758 |

Seven of them I bred; the reſt I bought: the latter coſt me very near three-pence per pound alive; and I value the others accordingly. Total, nineteen pounds, ſix ſhillings.

December tenth, began to fat, and the middle of February, began to kill and ſell them: the total live weight fat, two thouſand five hundred and fifty-ſix pounds. They ſold from five-pence to ſix-pence, yielding thirty-ſix pounds fourteen ſhillings and eight-pence; which, upon an average, is about five-pence farthing.

| | £. | s. | d. |
|---|---|---|---|
| Coſt and value of the Hogs | 19 | 6 | 0 |
| Waſhing - - - | 1 | 1 | 8 |
| Firing - - - | 1 | 1 | 8 |
| Boiling - - - | 0 | 10 | 10 |
| Barley, thirty-three buſhels, at 4s. | 6 | 12 | 0 |
| | 28 | 12 | 2 |

| Produce. | £. | s. | d. |
|---|---|---|---|
| Sold at - - | 36 | 14 | 8 |
| Deduct - - | 28 | 12 | 2 |
| Remains value of the Potatoes, which is per buſhel 7¼d. | 8 | 2 | 6 |

There

There were two reaſons for the fall from one ſhilling laſt year, to ſeven-pence halfpenny this. Pork did not ſell ſo well, while Barley kept to its price; and there were four among the Hogs that did not thrive kindly: all ſuch circumſtances, however, it is right to include, as the ſtandard value can only be aſcertained from the average of a variety of circumſtances. But let the Society always remember that, in addition to the value reſulting from feeding Hogs, there is the dung ariſing to be added, which is an object of the greateſt importance.

Beſides this trial to aſcertain the exact value, I had this winter an opportunity of examining how far this root might be uſeful to the common ſtock of Swine which ran looſe in the farm-yard: a large Boar, three Sows, and eight Stores, had no other food from November till the end of June, the Potatoes keeping perfectly well quite through that month. There was an eaſe and expedition in feeding

ing them that pleaſed me very much: a man with a ſpade dug into the heap, and threw them out of the barn-door twice a day, which he performed in two minutes: for experiment ſake, I meaſured them for ſome weeks, and the quantity was two buſhels a day, which kept thoſe hogs in very high order; they did not however eat the whole, for no attention could keep the cows and young cattle from partaking, which they did ſo eagerly, that I was convinced they would prove a beneficial food to them.

Suppoſe the Potatoe-ſeaſon ſix months, or one hundred and eighty days: twelve middling Hogs would require three hundred and ſixty buſhels, or an indifferent acre; and they would certainly, in a yard properly littered, raiſe dung enough to manure one acre very amply; which, with the profit of their growth, would, I am confident, amount to more than ſevenpence halfpenny a buſhel.

I tried

I tried them with a Horſe this winter, who eat them readily, inſomuch that I allotted him a peck a day, inſtead of half a peck of oats. He was employed in common home work, and did as well on them as on the Oats; but I cannot anſwer for the accuracy of the trial, as my ſervants were alarmed at any idea of their doing for Horſes, they are prejudiced in favour of Oats, and apprehenſive of more trouble.

| Produce. | £. | s. | d. |
|---|---|---|---|
| One thouſand five hundred and ſixty-two buſhels, at 7½d. - - | 48 | 16 | 3 |
| Expences - - - - | 48 | 9 | 3 |
| | 0 | 7 | 0 |

The Society will carry in their mind the importance of a fallow crop paying the expence of a rich manuring; for in that point, and not the expectation of a profit

profit beſides, lies the incitement to cultivate this root.

### EXPERIMENT VI.

CULTURE, EXPENCES, PRODUCE, AND APPLICATION OF SIX ACRES. 1774. The ſoil in part of this field much the ſame as that of the laſt Experiment, but the greater part inferior, a ſharper gravel. In autumn of 1773, ploughed it into four feet ridges, in which form I left it for the winter. April ſecond, 1774, began to cart the winter compoſt into it, ſee page 38, and finiſhed May twenty-firſt, finiſhing the planting alſo on that day: the dung was laid in the furrows in the ſame manner as before, and a ſingle row of ſets upon it; the quantity of manure, five hundred thirty-two loads. Immediately covered the dung and ſets, by one bout to every row as before; the twenty-fifth finiſhed reverſing the ridges. June firſt, harrowed them.

them. The twenty-fourth, ſliced the ridges, turning a furrow on each from the rows. The twenty-ninth, began to hand-hoe the rows. July fifth, horſe-hoed and harrowed the intervals. July nineteenth, &c. repeated that operation. Auguſt twentieth, ſtruck the intervals with double mould-board plough. October twenty-eighth, began to take up the crop. Heavy rains, November ſixth and ſeventh, which interrupted us; but finiſhed the fifteenth. The crop dry out of the barn, one thouſand ſix hundred and ſixty-ſeven buſhels, the expence of taking up which was, performed exactly as laſt year, ſeven pounds eighteen ſhillings and a penny, or one penny one-eighth per buſhel; add fourteen days of four horſes, at ſeven ſhillings and ſixpence, five pounds five ſhillings: in all, thirteen pounds three ſhillings and one penny, or near two-pence a buſhel, including the ploughing; the produce per acre, two hundred and ſeventy-ſeven buſhels.

Expences

| Expences. | £. | s. | d. |
|---|---|---|---|
| 1773. Ploughing, at 6s. | 1 | 16 | 0 |
| 1774. April, five hundred and thirty-two loads of compoſt, at 2s. | 53 | 4 | 0 |
| Forty-two buſhels, ſets 1s. | 2 | 2 | 0 |
| Cutting and planting | 1 | 0 | 0 |
| Ploughing | 1 | 16 | 0 |
| Harrowing twice | 0 | 9 | 0 |
| Slicing ridges | 0 | 18 | 0 |
| Hand-hoeing | 0 | 14 | 0 |
| Horſe-hoeing | 0 | 9 | 0 |
| Double mould-board plough, 5s. | 1 | 10 | 0 |
| Taking up, carting home, and packing | 13 | 3 | 1 |
| Annual expences, at 11s. 8d. | 3 | 10 | 0 |
| | 80 | 11 | 1 |

VALUE

### VALUE ASCERTAINED.

THE middle of December put five of my Stores to fatting: they weighed, alive, five hundred and ſixty pounds; and I am to value them at three-pence per pound, or ſeven pounds: confined them to a ſmall yard by themſelves, well littered with clean wheat ſtraw (an object eſſential to fattening Hogs to profit); and gave them twenty buſhels of boiled Potatoes, no meal mixed with them: when they had finiſhed that meſs, they had another ready, conſiſting of eighty buſhels of Potatoes boiled, maſhed, and mixed with the meal of eight buſhels of Barley, which completed their fattening. They were ſold alive for thirteen pounds ten ſhillings, and weighed nine hundred and ſeven pound. Pork was at five-pence half-penny.

Expences.

| Expences. | £. | s. | d. |
|---|---|---|---|
| Value of the Hogs - | 7 | 0 | 0 |
| Eight buſhels of barley, at 3s. 10d. - - | 1 | 10 | 8 |
| Waſhing a hundred buſhels Potatoes, 1½d. - | 0 | 12 | 6 |
| Boiling, ¼d. - - | 0 | 4 | 2 |
| Fuel, 1d. - - - | 0 | 8 | 4 |
| | 9 | 15 | 8 |
| Sold at - - - - - | 13 | 10 | 0 |
| Deduct - - - - - | 9 | 15 | 8 |
| Remains value of Potatoes | 3 | 14 | 4 |

Which is per buſhel nine-pence.

I ſhould have made a larger experiment than upon five Hogs, had I not been abſent a good deal this winter, and at the farm only once a week for ſome time. Two of theſe hogs were Chineſe, and far excelled the reſt in the thriving.

Beſides

Beſides this trial, I attended to the lean ſtock: ten Stores, pigged the twenty-eighth of June preceding, with two large Sows and a Boar, were carried through the winter on Potatoes, thrown out of the barn, in the manner before deſcribed, till the Clover was ready for them in May; and they eat juſt two buſhels a day. The ten were ſold from the Clover, in the October following, at thirty ſhillings each. I was very attentive to the progreſs of theſe Hogs; and I am clear, that by buying or taking one's own to Potatoes in November, when at the value of ten ſhillings a ſtore, they will be on an average thirty ſhillings, from the following Clover; and I found this, on repeated obſervation, as well as on this trial. In this way they have ſix months Potatoes and ſix months Clover. An acre of good Clover, which will ſell in the country, out of the ſphere of London hay-markets, for forty ſhillings, will carry ſixteen Hogs that time, and afford food for a young Heifer, or Steer. Beſides

allowing for the ſize of the two Sows and the Boar, and alſo for the Potatoes eaten by Cows and other ſtock, I am clear the two buſhels a day would amply maintain ſixteen Hogs.

| | £. | s. | d. |
|---|---|---|---|
| Profit on ſixteen Hogs, bought at ten ſhillings, and ſold at thirty | 16 | 0 | 0 |
| Deduct for one acre Clover | 2 | 0 | 0 |
| Remains value of the Potatoes - - - | 14 | 0 | 0 |
| Which, for three hundred and ſixty buſhels, is per buſhel nine-pence farthing. | | | |

Price depending partly on valuations, the Society may not approve it equally with fattening trials; but I am, from repeated obſervations, clear, that it is not above the truth; and I have been more than a dozen years largely in the huſbandry of feeding Hogs on Clover.

Produce.

| Produce. | £. | s. | d. |
|---|---|---|---|
| One thouſand ſix hundred and ſixty-ſeven buſhels, at 9d. - - - | 62 | 10 | 3 |
| Expences - - | 80 | 9 | 1 |
| Loſs - - - | 17 | 18 | 10 |

This produce was much inferior to what I had reaſon to expect; but, the ſtate of the field conſidered, the loſs of three pound per acre is not to be thought any alarming circumſtance. There is no crop of Turneps in this country worth above three pounds: that crop would have left a balance againſt me of more than forty pounds; and yet nobody can aſſert that Turneps are not profitable; but the ſtate which all theſe crops leave the land in, is the great object.

### EXPERIMENT VII.

COMPARISON OF MANURES FOR THE HOWARD POTATOE. April 5, 1774. Marked twelve perch on a poor gravelly ſoil, but which in the preceding years had been very well drained and ploughed; made twelve ſquare lazy beds of them; ſpread the following manures on them, leaving a ſmall ſpace around for digging the trenches; laid the ſets twelve inches aſunder on the manure; then covered both about four inches deep out of the trenches.

No. 1 No manure for compariſon.
2 Five buſhels of night ſoil
3 Three ditto ditto
4 One ditto ditto
5 Five buſhels of bones, broken ſmall.
6 Three ditto ditto
7 One ditto ditto
8 Six buſhels of hog-dung, rotten

9 Three ditto ditto
10 Six buſhels of common yard compoſt
11 Twelve ditto ditto
12 Three ditto ditto

They were kept clean by hand-weeding.

November 15, dug and meaſured them immediately.

No. 1 Three pecks
2 Three buſhels three pecks
3 Four ditto and a quarter of a peck
4 Three ditto and a half ditto
5 Four ditto and a quarter ditto
6 Four ditto
7 Three and a half ditto
8 Three ditto
9 Three ditto
10 One ditto three pecks and a half
11 Three buſhels
12 Three pecks and a half

Proportions per acre of Manure and Crop.

| | | Crop |
|---|---|---|
| No. 1 | - - - | 120 *buſhels* |
| 2 | Night-Soil, ten wag-gon-loads* | 600 |
| 3 | Ditto, ſix ditto | 650 |
| 4 | Ditto, two ditto | 500 |
| 5 | Bones, ten ditto | 650 |
| 6 | Ditto, ſix ditto | 640 |
| 7 | Ditto, two ditto | 560 |
| 8 | Hog dung, ſixty cart-loads† - - | 480 |
| 9 | Ditto, thirty ditto | 480 |
| 10 | Yard Compoſt, ſixty ditto - - | 300 |
| 11 | Ditto, one hundred and twenty ditto | 480 |
| 12 | Ditto, thirty ditto | 140 |

The land remained through the winter untouched till April eighteenth, 1775; when dug the perches, and planted them again

* Of ninety-ſix buſhels.

† As in the preceding Experiments.

again as before. October nineteenth, dug them; the produce as follows:

| | | *Per acre.* |
|---|---|---|
| No. 1 | Three pecks and a half - - | 140 *buſhels* |
| 2 | Four buſhels - | 640 |
| 3 | Three ditto and half a peck - - | 500 |
| 4 | One ditto, three pecks and a half - | 300 |
| 5 | Four buſhels - | 640 |
| 6 | Three buſhels and a half - - | 560 |
| 7 | One and a half ditto | 240 |
| 8 | One buſhel three pecks and a half - - | 300 |
| 9 | One ditto - - | 160 |
| 10 | One buſhel and a half | 240 |
| 11 | One ditto and three pecks and a half | 300 |
| 12 | Three pecks and a half - - | 140 |

There are ſeveral circumſtances in the reſult of this trial, which can not poſſibly

be accounted for, which is generally the caſe with comparative ones of many parts: in general it ſhews that animal manures are the beſt in proportion to their ſtrength. Bones not only yield a rich nouriſhment, but lighten the mould for the roots; but night-ſoil has not this effect, unleſs from a ſtrong fermentation: bones ſeem to be the preferable manure, and will certainly laſt longer. The efficacy of rotten hog-dung appears conſiderable; and the advantage of a ſecond crop of Potatoes is clearly eſtabliſhed, the latter of which, not having the expence of manuring, muſt neceſſarily yield a very great profit.

## EXPERIMENT VIII.

CULTURE, EXPENCES, PRODUCE, AND APPLICATION OF FIVE ACRES. 1775. The ſoil, a ſharp, wet, ſpringy, miſerable gravel,

vel, the worſt field on the farm, and not intrinſically worth five ſhillings per acre. Began to plough it December twenty-eighth, 1774, only four feet ridges. April twenty-firſt, 1775, began the manuring with the yard compoſt of the preceding winter, laying the dung in the furrows as before; the whole quantity, three hundred and twenty-ſix loads. Finiſhed May fifth; and the planting the thirteenth, as before. Horſe-hoed the furrows with ſhim, and double mould-board, finiſhing June the third. July eleventh, turned a furrow from the rows, which I call ſlicing. The twentieth, began to hand-hoe them, and finiſhed in five days. The twenty-eighth, horſe-harrowed the intervals, and afterwards ſtruck them up with double mould-board plough. October tenth, began to take them up, finiſhing the eighteenth; the crop, the pooreſt I ever had, only ſeven hundred and fifty buſhels, or one hundred and fifty per acre; total expence, taking

taking up, carting, &c. ſeven pounds five ſhillings.

| Expences. | £. | s. | d. |
|---|---|---|---|
| 1774. Ploughing, 6s. - - | 1 | 10 | 0 |
| Water furrowing - | 0 | 6 | 6 |
| 1775. Compoſt, three hundred and twenty-ſix loads, 2s. | 32 | 12 | 0 |
| Slicing and planting - | 0 | 15 | 0 |
| Thirty-five buſhels | 1 | 15 | 0 |
| Ploughing - - - - - | 1 | 10 | 0 |
| Horſe-hoeing, ſhim, 9d. | 0 | 3 | 9 |
| Double mould-board, 5s. | 1 | 5 | 0 |
| Slicing, 3s. - - - - - | 0 | 15 | 0 |
| Hand-hoeing - - | 0 | 10 | 0 |
| Horſe-hoe harrowing | 0 | 3 | 9 |
| Double mould-board | 1 | 5 | 0 |
| Taking up - - - - - | 7 | 5 | 0 |
| Annual expence, 11s. 8d. | 2 | 18 | 4 |
| Value aſcertained | 52 | 14 | 4 |

Three Stores of the true Chineſe breed were in December weighed alive; the weight, two hundred and ninety-ſeven pounds, which at two-pence halfpenny, the

the price I ſold others at, came to three pounds one ſhilling and ten-pence. Theſe were put to fattening; having boiled ſixty buſhels of Potatoes, and mixed the maſh with ſix of barley-meal, the food done, they were killed. Not being at home myſelf till afterward, the ſervants neglected to weigh them alive; but the dead weight was three hundred and fourteen pound, which, at ſix-pence a pound, the price then, is ſeven pounds ſeventeen ſhillings.

| | £. | s. | d. |
|---|---|---|---|
| Value of the Hogs | 3 | 1 | 10 |
| Six buſhels meal, 4s. | 1 | 4 | 0 |
| Waſhing ſixty buſhels Potatoes, 1d. - . | 0 | 5 | 0 |
| Fuel, 1d. - - | 0 | 5 | 0 |
| Boiling, a halfpenny | 0 | 2 | 6 |
| | 4 | 18 | 4 |

Value

| | £. | s. | d. |
|---|---|---|---|
| Value fat - - - | 7 | 17 | 0 |
| Deduct - - - - - | 4 | 18 | 4 |
| Remains, being the value of Potatoes - - | 2 | 18 | 8 |

Or, per buſhel, eleven-pence halfpenny.

I attribute this high value very much to the breed of the Hogs, which makes a greater difference than many perſons would without experience conceive.

Beſides this trial, I had, in the ſupport of my ſtore Hogs this winter, ample reaſon to be ſatisfied with this Potatoe. I had twenty-four Sows, Boars, and half-grown Stores, all which I carried through the winter; a ſtock larger than was to be found on any farm in the country four times as extenſive as mine. My crop however not being ſo abundant as in preceding years, I did not give them Potatoes till Janaary the twenty-third, it being then a moſt ſevere froſt. They had ſubſiſted upon

Turneps

Turneps and Acorns, the latter of which I had bought at one ſhilling a buſhel: twenty-one Hogs in the yard eat juſt a cart load, eighteen buſhels of Turneps and one buſhel of Acorns, a day: but the latter being finiſhed, and the Turneps quite frozen, I then fully experienced the convenience of the Potatoe ſtore, without which, all my ſtock muſt have been ſold. Upon their being done, which was in April, I bought brewers grains for them; but the Hogs fell off in their looks ſo much, that I was forced to add an allowance of Barley for them. The Stores were turned in May to Clover; and I am clear that the Potatoes in this application paid me at leaſt nine-pence a buſhel. I would not have ſold them at the barn-door, during the froſt, at one ſhilling and ſix-pence.

| | £. | s. | d. |
|---|---|---|---|
| By fattening - - | 0 | 0 | 11½ |
| By lean ſtock - - | 0 | 0 | 9 |

Average, ten-pence farthing.

Produce.

| Produce. | £. | s. | d. |
|---|---|---|---|
| Seven hundred and fifty buſhels, at 10¼d. - - | 32 | 0 | 7 |
| Expences - - | 52 | 14 | 4 |
| Loſs - - | 20 | 13 | 9 |

I deſerve much more condemnation than the Potatoes for this loſs: the ſoil was not to be truſted to, and accordingly gave me the worſt crop I ever had.

### EXPERIMENT IX.

CULTURE, EXPENCES, AND PRODUCE, OF HALF AN ACRE. 1775. In the years 1773 and 1774, I had tried ſome very ſmall experiments, in order to aſcertain the moſt profitable diſtance at which to place the rows of the Howard Potatoe. They were not in the reſult attended with any abſolute deciſion; but I collected from them that I had hitherto given my crops too

too much room to have a large produce. Theſe little trials, which are very uſeful by way of hints, though not often worth keeping detailed accounts of, led me to try half an acre in another mode: the ſoil, a good dry ſandy loam. The operations were moſt of them performed at the ſame time as thoſe deſcribed in the preceding experiment; as the implements, &c. went from one to the other. It was a barley ſtubble left through the winter, on which fifty loads of the compoſt were ſpread over the whole ſurface; the plough then went in; and in reverſing the former flat lands, every other furrow was planted, the ſets at twelve inches aſunder; and as the plough carried nine inches, the Potatoes of courſe were in rows eighteen inches apart: five buſhels planted the half acre. Women laid, not dropped, the ſets cloſe to the unploughed ſide of the furrow, to eſcape, as much as might be, the horſes feet: as ſoon as finiſhed, harrowed the land twice; then rolled with a barley-roller, and harrowed once

once again, leaving it in fine order. In about a fortnight, or a little more, there was great appearance of Seed-weeds coming up: as theſe threatened a heavy expence of hoeing, I thought of cutting them all off, by going over the ſurface with the horſe-hoeing ſhim, which I did with my own hands; being apprehenſive that, if it went too deep, the ſhoots of the Pototoes which did not yet appear might be cut. Nothing could anſwer better than this operation, which however ſhould never be ventured but in dry weather. I then harrowed it: when the Potatoes were three inches high, the rows were hand-hoed, and, directly after, the intervals horſe-hoed with a ſhim, that cut only twelve inches wide. Both theſe operations were repeated once more afterwards; and, the end of Auguſt, a hand-weeding was given: the crop carried a moſt ſuperior appearance. In taking them up, the men, with their three-pronged forks, worked every

every furrow. The produce, two hundred and ſeventy-five buſhels, or per acre five hundred and fifty.

Expences per acre.

| | £. | s. | d. |
|---|---|---|---|
| One hundred loads of compoſt, at 2s. | 10 | 0 | 0 |
| Ploughing | 0 | 6 | 0 |
| Slicing and planting | 0 | 4 | 0 |
| Ten buſhels of ſets | 0 | 10 | 0 |
| Three harrowings, at 9d. | 0 | 2 | 3 |
| Rolling | 0 | 0 | 2 |
| Shimming the ſurface | 0 | 2 | 0 |
| Harrowing | 0 | 0 | 9 |
| Hand-hoeing | 0 | 6 | 6 |
| Horſe-hoeing with ſhim | 0 | 1 | 6 |
| Second hand-hoeing | 0 | 5 | 0 |
| Shim | 0 | 1 | 6 |
| Hand-weeding | 0 | 3 | 0 |
| Taking up, &c. | 3 | 8 | 9 |
| Annual expences | 0 | 11 | 8 |
| | 16 | 3 | 1 |

| Produce. | £. | s. | d. |
|---|---|---|---|
| Five hundred and fifty buſhels, at 10¼d. - - - | 23 | 9 | 9 |
| Expences - - - | 16 | 3 | 1 |
| Profit - - - - - | 7 | 6 | 8 |

OBSERVATIONS.

Every circumſtance of this crop convinced me that the mode purſued was far preferable to what I had hitherto practiſed, unleſs a field ſhould be exceedingly full of root-weeds, in which caſe the wide intervals are uſeful; but then I ſhould reccommend Turneps in preference. The produce of this trial is great; and the profit of above ſeven pounds an acre, after paying a manuring of ten pounds muſt be conſidered as one of the moſt beneficial crops that can be put into the ground, and would eſtabliſh the utility of the huſbandry, if there were not the after-advantages of the uſes in raiſing dung.

EXPERIMENT

## EXPERIMENT X.

CULTURE, EXPENCES, PRODUCE, AND APPLICATION, OF FIVE ACRES. 1776. Part of the field gravelly, but not very wet, the reſt a good ſandy loam; the firſt fortnight in November, ploughed it on to the two-bout ridge, acroſs the uſual way of ploughing the field, and water-furrowed it thoroughly; April 4th, &c. drew thoſe ridges into balks, at one bout to each. The ninth, harrowed acroſs the balks, leaving the ſurface of the field ſmooth. The next day began the manuring, and finiſhed it the eighteenth; three hundred and ſeventy-three loads were carried to it. The nineteenth began to plough it into flat lands, the uſual way of ploughing the field, planting every other furrow in the manner deſcribed in the preceding experiment; and I found, on trial, that four women were juſt ſufficient to plant ſo as to keep one plough at work. Finiſhed the

twenty-ſixth, harrowed and rolled the ſurface alternately, the weather being remarkably fine and dry, till it was very fine and ſmooth. Thus far I perſonally attended putting them in; but being abſent the whole ſummer, I muſt conſult the regiſter of the work done in my abſence, for the operations they had whilſt growing. I ordered them not to ſhim the ſurface as I had done the year before, leſt they ſhould time it wrong, or cut too deep; they were twice harrowed, once horſe-hoed with narrow ſhim, and once hand-weeded; the twenty-firſt of October, they began taking up, working every furrow, and finiſhed the fourteenth of November. I returned the twelfth. Produce, two thouſand one hundred and twelve buſhels; expence of taking up, eleven pounds five ſhillings and four-pence. The account returned to me was certainly accurate, from the above quantity of clean Potatoes, ariſing in the winter, correſponding with their groſs return of two thouſand

ſand four hundred and thirty, which is a ſeventh for dirt, as much as it would be in that field.

| Expences. | £. | s. | d. |
|---|---|---|---|
| 1775. Ploughing, 6s. | 1 | 10 | 0 |
| Water furrowing | 0 | 10 | 0 |
| 1776. Balking, at 3s. | 0 | 15 | 0 |
| Harrowing twice, 9d. | 0 | 7 | 6 |
| Three hundred ſeventy-three loads of compoſt, 2s. | 37 | 6 | 0 |
| Ploughing, 6s. | 1 | 10 | 0 |
| Cutting ſets and planting | 0 | 16 | 0 |
| Harrowing four times, 9d. | 0 | 15 | 0 |
| Rolling twice, 2d. | 0 | 1 | 8 |
| Two hand-hoeings, 10s | 2 | 10 | 0 |
| Horſe-hoeing with ſhim, 9d. | 0 | 3 | 9 |
| Hand-weeding, 3s. | 0 | 15 | 0 |
| Taking up, &c. | 11 | 5 | 4 |
| Annual expences, 11s. 8d. | 2 | 18 | 4 |
| Value aſcertained | 51 | 3 | 7 |

Not expecting to be able to be ſo much at my farm this winter as I afterwards was, I made no preparations for fattening Hogs; yet I never had, that article excepted, a more various experience of their importance. I began the winter with thirty-five ſtock Hogs, afterwards encreaſed to ſixty-three by Pigs. The Stores, the running ſtock of twenty-three, were ſupported in the farm-yard, in the manner before deſcribed; and I cannot but repeat once more, that keeping ſuch a number, with no other trouble than twice a day opening a barn door, throwing out four buſhels of Potatoes, two buſhels in the morning, and as much more in the evening, is ſuch a convenience, that thoſe who have not tried will ſcarcely believe it. This general application of the crop to lean Hogs, I have every reaſon to continue to value at nine-pence a buſhel.

December ſixteenth, &c. in order to ſee what quantity Hogs of different ſizes would

would conſume, as many as they would eat were given them; tried five of a ſize, from twenty-five pound to ſeventy pound alive, and they eat ſcarcely one buſhel a day: at the ſame time tried a very large Northamptonſhire Boar, and four Sows; they eat a buſhel and three quarters a day: thirteen Stores, from forty to eighty pound each, eat two buſhels a day. Theſe are very uſeful hints towards enabling a farmer to proportion his crop to his ſtock. They had no other food whatever; at the ſame time I found that one truſs of wheat ſtraw, forty pound, per diem, was ſufficient to litter thirty-five in their different ſtyes. They would have made more into dung; but this ſufficed to keep them clean and healthy for a winter of one hundred and eighty days; this is five loads. The quantity and goodneſs of the dung are well known.

Beſides Hogs, I met the winter with nine Cows, a Bull, and Heifers, beſides ſix yearling Calves; and I never was worſe

provided with hay or ſtraw: if it had not been for my barn being full of Potatoes, the quantity of Hay I muſt have bought, would have been a heavy article. I put three of the Yearlings to Hay, and at the ſame time the three others to a very little Straw and Potatoes; it was not an experiment eaſily reduced to figures; but this I can ſay, that, valuing hay in the yard at two pounds two ſhillings a load, or a farthing a pound, the Potatoes the Calves eat at two-pence the half-peck, I thought equally paid by the Calves doing as well as on the Hay; though I ſhould remark that I have before this had yearling Calves that ſcoured much on them, and others that did not thrive. I don't mention the trial therefore as concluſive. The Cows had large quantities, and did very well: two Horſes that had been quite worked down, put to Hay and Potatoes November eighteenth, and had a buſhel a day between them; they throve very well, and ſoon recovered their looks: and I am con-

convinced from this, as well as other trials, that they would prove a beneficial food; but much depends on their being waſhed perfectly clean. It will coſt two-pence a buſhel, for waſhing the cluſtered ſort clean enough for horſes: thoſe much cluſtered ſhould be thrown by for other uſes, as they will not waſh well.

| Produce. | £. | s. | d. |
|---|---|---|---|
| Two thouſand one hundred and twelve buſhels, at 9d. | 79 | 4 | 0 |
| Expences — — — | 61 | 3 | 7 |
| Profit, 3: 12: 0 per acre | 18 | 0 | 5 |

The reſult of this crop ſhews that the mode of planting I am now in is preferable to the old way of furrows: the produce is conſiderable; and the profit, after paying the manuring, muſt be eſteemed larger than can on ſuch land be had from any other fallow crop.

Reca-

| Recapitulation of Value. | £. | s. | d. |
|---|---|---|---|
| By Experiment No. 4, fattening Hogs — | 0 | 1 | 0 |
| By ditto No. 5, ditto — | 0 | 0 | 7½ |
| By ditto No. 6 ditto — | 0 | 0 | 9 |
| By ditto No. 6, lean Hogs | 0 | 0 | 9½ |
| By ditto No. 7, fattening Hogs — — | 0 | 0 | 11½ |
| By ditto No. 7, lean Hogs | 0 | 0 | 9 |
| By ditto No. 9, ditto | 0 | 0 | 9 |
| By ditto No. 9, Calves | 0 | 0 | 8 |

Average, nine-pence farthing.

Rejecting the fraction, and calling the value at nine-pence, I am clear we ſhall not exceed, and that they who do not make that, muſt be bad managers at firſt, who will arrive at, and perhaps exceed it afterwards. Let me next conſider what crop it muſt be, to pay expences at the valuation. I will ſuppoſe the latter and beſt mode of culture, ten pound an acre for dung, and the land good enough to have the annual expences twenty ſhillings: mine

are

are only eleven ſhillings and eight-pence, but then it is much below the ſtandard to be deſired for Potatoes. I will ſuppoſe the expences as follow:

| | £. | s. | d. |
|---|---|---|---|
| Manure — — | 10 | 0 | 0 |
| One ploughing — | 0 | 6 | 0 |
| * Ten buſhels Seed — | 0 | 10 | 0 |
| Cutting and planting — | 0 | 3 | 6 |
| Three harrowings — — | 0 | 2 | 3 |
| Rolling — — | 0 | 0 | 2 |
| Going over the ſurface with ſhim — — | 0 | 2 | 0 |
| Two hand-hoeings — | 0 | 10 | 0 |
| Horſe-hoeing with ſhim | 0 | 1 | 6 |
| Hand-weeding — | 0 | 4 | 0 |
| Taking up, &c. — | 2 | 5 | 0 |
| Annual Expences — | 1 | 0 | 0 |
| | 15 | 4 | 5 |

Hence

* The trouble of picking over, and ſorting the Potatoes included, I think one ſhilling a buſhel a fair valuation. I always keep thoſe moſt cluſtered for ſeed.

Hence, therefore, we find that four hundred buſhels, at nine-pence, will juſt pay theſe expences, upon tolerable land, with ten pounds worth of manure. I think the Society will believe that there is hardly a doubt of receiving ſuch a produce: a much greater, I am confident, might be expected; but if the expence of ſo ameliorating a crop, the conſumption of which raiſes ſo much dung, were only paid, I believe there is no Farmer that would not think himſelf well off.

And here I cannot but call the Society's attention to the extreme inſignificance of the article rent, among the expences. I am clear there are ſoils let at twenty ſhillings an acre their value, which, without any manure at all, would give better crops than my eight ſhilling gravels would do with ſuch manurings as I have deſcribed; for all the branches therefore of elaborate cultivation, a Renter ſhould ſeek for the beſt natural ſoil; one may almoſt aſſert that he cannot pay too dear for it, ſince,

if he attempts by manuring to make a poor ſoil equal to it, he will find the expence enormous, and almoſt endleſs. There are vaſt tracts in England of dry, ſound, mellow, friable loams, at twenty ſhillings an acre, landlord's rent, which, with only common management, yield large crops of Turneps, ſix quarters of Barley, ſeven of Oats, and four of Wheat: theſe are products which forty ſhillings per acre per annum, expended on my wet gravels, would never make them equal to. Thoſe are the ſoils upon which this Potatoe culture would make a figure.

Recapitulation of Profit and Loſs.

| | £. | s. | d. |
|---|---|---|---|
| Experiment No. 2, Profit per acre — — | 3 | 19 | 2 |
| No. 4, ditto — | 0 | 0 | 8 |
| No. 5, ditto — — | 0 | 1 | 10 |
| No. 8, ditto — | 7 | 6 | 8 |
| No. 9, ditto — | 3 | 12 | 0 |
| No. 6, Loſs per acre | 2 | 19 | 9 |
| No. 7, ditto — | 4 | 2 | 9 |

COURSE

COURSE OF CROPS IN WHICH IT IS ADVANTAGEOUS TO INTRODUCE THE HOWARD POTATOE.

The two experiments upon which I chiefly found what I have to obſerve under this head, are the fifth and the ſixth in the preceding account; as in thoſe I truſted to the Potatoe crops as a fallow, previous to laying down to meadow, which demands as clean and careful a fallow as any object poſſibly can. After the crops of thoſe fields were taken up, the land was well water-furrowed, and repeated tillage given in the ſpring for Barley, with which, on the four acres of experiment No 5, were ſown,

Forty pounds of White Clover,
Forty pounds of Rib Graſs,
Thirty-five pounds of Cow Graſs,
Five pounds of Marle Graſs,
Five pounds of Common Rep Clover.

The Marle and Common Red were on lands by themſelves, for experiment: the Barley yielded five quarters an acre. The above

above ſeeds took perfectly well, and made a clean, and, for the ſoil, valuable meadow. After Potatoes on the ſix acres of experiment No. 6, Barley was alſo ſown, except half an acre, which had a buſhel of Ducket's Spring Wheat: the Barley yielded four quarters and a half an acre; the Wheat was ſcarce worth reaping; with them the following ſeeds:

One hundred pounds of Rib Graſs,
Seventy pounds of Cow Graſs,
Sixty pounds of Yellow Trefoil,
Twelve pounds of White Clover.

The three firſt equally over the whole field, the laſt only over two acres of it, to ſee the difference: the whole field formed, for the country, a very clean good meadow, anſwering to my wiſh. I may therefore aſſert the fallow of this Potatoe equal to the preparation for meadow.

But for a common courſe of crops, I ſhould recommend Wheat to follow Potatoes: herein however, as far as the preceding

preceding trials extend, I ſpeak from theory, for none of them were followed by that grain; but from attending particularly to the ſtate in which theſe crops left the ſoil, as well as from other trials, I am induced to think that the proper management in this caſe, the Wheat ſhould be ſown as the plough goes upon the land turned by the plough, not in the furrow or path of it, before the men break it with their three-pronged forks. In taking up my crop, that operation covers the Wheat effectually without burying it too deep, and leaves it admirably put in. The following is the ſucceſſion of crops I recommend on this plan.

Firſt, Potatoes.
Second, Wheat.
Third, Turneps.
Fourth, Barley.
Fifth, Clover.
Sixth, Wheat.

All

All the dung beſtowed in the ſix years to be laid on for the Potatoes; and this courſe, I am inclined to think, take it for all in all, is the beſt and moſt profitable that can be practiſed on all ſoils that will do for thoſe two roots, and for theſe reaſons.

One third of the arable land is every year in Wheat, which is as much as poſſibly can be ſown in any profitable courſe. It contains ſpring corn, the ſtraw of which is neceſſary for Cattle; the Turneps do for the ſheep of the farm; and the Clover will feed in ſummer the ſtock Hogs, ſupported in winter by the Potatoes: with this great advantage, the two crops of Wheat are put in at ſcarce any expence; one ploughing of the Clover land; no other expence on Potatoes than mere ſowing, ſince all the reſt is done in order to take up that crop. The only apparent objection is this, that you chooſe the dryeſt ſeaſon to take up the Potatoes, but a wet one to put in

Wheat: on ſoils ſo very dry that rains are neceſſary for the Wheat ſowing, the land muſt be left, and the ſeed harrowed in; but on the dryeſt lands I have farmed, no rain is wanted to put in Potatoes. The practiſe alſo of ſowing Wheat in the wet is often carried much too far; upon the whole, I venture to recommend this courſe as one which includes on a farm every circumſtance that is eſſential. The Norfolk huſbandry of firſt Turneps, ſecond Barley, third Clover, fourth Wheat, is excellent; but it has this great objection, that the ſmall value of the Turneps will not pay for manuring; and I conſider it eſſential to a courſe, that the fallow crop ſhould pay its own expence, including manure.

I am ſenſible the preceding experiments are very incomplete, and my knowledge of it prevented my ſending the account to the Society in 1777. I meditated farther trials, in a ſituation that would permit me to diſcover the effect of the cultivation here

here recommended, upon a very good dry loam; but being repeatedly diſappointed in that expectation, I think it better to venture to the Society's examination, without longer waiting for uncertain circumſtances. If this firſt opening of my practice on the Potatoe ſhould inſtigate others to make experiments, who are better able to puſh the culture vigorouſly, I may then be the means of ſerving the public, though ſlightly.

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The ingenious Author of the foregoing Obſervations on the Howard or Cluſtered Potatoe, has communicated to the Society an account of his further Experiments on the uſes of that root, continued to the year 1784; which are intended to make part of a future volume of the Tranſactions of this Society.

# PAPERS

IN

# POLITE ARTS.

# POLITE ARTS.

AN account of the proceedings of the Society reſpecting the PICTURES painted by JAMES BARRY, Eſq. R. A. and Profeſſor of Painting to the Royal Academy, for the decoration of their Great Room, with a deſcription of the ſeveral ſubjects of thoſe Pictures.

IN the Firſt Volume of the Tranſactions of this Society, page 60, and in the Second Volume, page 250, mention is made of the Pictures then painting for the decoration of the Society's Great-Room, by James Barry, Eſq. R. A. and Profeſſor of Painting to the Royal Academy; and a promiſe given, that in ſome

future volume a full deſcription of the ſeveral ſubjects of the Pictures, and alſo a detail of the proceedings on this head, ſhould be laid before the public.

The preſent ſeaſon is judged moſt proper for the introduction of this account; the Society having now reſumed their meetings in the Great Room, which, to prevent any inconvenience the Artiſt might have been ſubjected to, had they aſſembled therein during the proſecution of the work, were three ſeaſons held in the Committee-Room.

In the month of March, 1777, the Society received, from Valentine Green, Eſq. a propoſal, made by a Member of the Royal Academy, to decorate their Great Room, with a ſeries of Pictures analogous to the views of the Inſtitution. The price of Cloths, Stretching Frames, and Colours, which the Society engaged to pay, was eſtimated at one hundred pounds; and the further expence of thirty pounds for Figures, which the Artiſt offered

offered to pay himſelf, they alſo agreed to defray. It ſoon after appeared that the Artiſt who had made this generous offer, was JAMES BARRY, Eſq. R. A. and he was empowered to call on the ſeveral neceſſary tradeſmen, and furniſh himſelf with Figures, agreeable to the reſolutions of the Society.

In the year 1778, the Pictures being far advanced, and the Artiſt having arrived at that part of the work which is modern, national, and immediately relating to the Society itſelf, where a few of the Portraits of its Members are neceſſarily to be introduced, the Society reſolved, that the Preſidency of the Society ſhould be ſelected for that purpoſe.

In that Picture to which this reſolution particularly refers, and which is the fifth in the ſeries, the Artiſt has ſince added ſeveral other Portraits of the more celebrated perſons of the preſent time, as will be fully enumerated in the ſubſequent account of the ſubject of each particular

ticular Picture. This year alſo, during the receſs of the Society, the key of their Great Room was intruſted to Mr. Barry, in order to prevent his being in any manner interrupted in the proſecution of his laborious undertaking,

During the latter part of the year 1779, and the beginning of the year 1780, the meetings of the Society were held in their Great Room, the Pictures being occaſionally covered with canvas; but in the year 1781, the Society, ſtill further to prevent every inconvenience that might ariſe to the Artiſt from their aſſembling in their Great Room, diſcontinued their meetings therein, which were afterwards held only in their Committee-Room, till October 1784. In the year 1781, Frames for the Pictures, according to the deſign and direction of Mr. Barry, were ordered by the Society to be made by Mr. Adrian Maſkens, of Compton-Street, Soho, at the expence of one hundred pounds, ſeventeen ſhillings. The Society, conſcious of

of the merit of the Pictures, did alſo, in the year 1781, reſolve, That Mr. Barry have leave to make an exhibition of the Pictures for his own emolument, which exhibition was propoſed to continue during the ſpace of four months; and to defray the expence, the Society agreed to advance the ſum of one hundred and ſeventy-four pounds; at the ſame time the ſum of fifty pounds was voted to Mr. Barry, to be applied to ſuch purpoſes as he ſhould judge proper.

The only alteration that took place in the diſpoſal of this money, was, that inſtead of one exhibition to continue four months, in one ſeaſon, the Society conſented that the time of exhibiting the Pictures ſhould be divided, and one exhibition of two months be permitted in their Great Room, in the year 1783, and another for the ſame period in 1784; and to defray the expence of the ſame, the ſum of eighty-ſeven pounds was each year paid by them, making together the ſum

of

of one hundred ſeventy-four pounds originally voted.

In the ſpring of the year 1783, and again in the ſpring of the year 1784, the pictures were publicly exhibited. Each year, previous to theſe exhibitions, the Society received a polite invitation from Mr. Barry; and, having aſſembled in a General Meeting, viewed the paintings, and reſolved, That the ſeries of Pictures, illuſtrating, in their deſign, the progreſs of human knowledge, and the advancement of uſeful and elegant Arts, from a very early period to the preſent æra, is a work of great excellence of compoſition, maſterly execution, and claſſical information, and muſt be deemed a national ornament, as well as a monument of the talents and ingenuity of the Artiſt. The Society, therefore, deſirous of giving the moſt ample teſtimony of his eminent abilities, unanimouſly voted him their thanks, and ordered that this reſolution be publiſhed in the newspapers.

The

The two Exhibitions being cloſed, and Mr. Barry having delivered up the key of the Great Room, the meetings of the Society recommenced on the twenty-ſeventh of October, 1784, and have ſince that time been conſtantly held therein.

Having thus given a ſhort hiſtory of the proceedings of the Society reſpecting the Paintings which now decorate their Great Room; it becomes neceſſary to lay before the Public, a general deſcription of the ſubject of the Pictures, with their ſeveral dimenſions, and ſubjoin thereto an account of the particular ſubject of each Picture ſeparately. The far greater part of this deſcription, is extracted from a work publiſhed by Mr. Barry, under the title of "An Account of a Series of Pictures in the Great Room of the Society for Encouragement of Arts, Manufactures, and Commerce, at the Adelphi."

It may be proper to obſerve, that the room in which theſe Pictures are placed,

is

is, in length, from Eaſt to Weſt, forty-two feet five inches; in breadth, from North to South, thirty-five feet ſeven inches; and lighted only by a dome at the top.

## GENERAL SUBJECT.

THIS ſeries conſiſts of Six Pictures, on uſeful and agreeable ſubjects, ſo connected as to illuſtrate this great maxim, or moral truth, viz. THAT THE OBTAINING HAPPINESS, AS WELL INDIVIDUAL AS PUBLIC, DEPENDS ON CULTIVATING THE HUMAN FACULTIES. To prove the truth of this doctrine, the firſt Picture exhibits mankind in a ſavage ſtate, full of imperfection, inconvenience, and miſery. The ſecond repreſents a Harveſt Home, or Thankſgiving to Ceres and Bacchus; the third, the Victors at Olympia; the fourth, Navigation, or the Triumph of the Thames; the fifth, the Diſtribution of

of Rewards by the Society; and the ſixth, Elyſium, or the State of final Retribution. Three of theſe ſubjects are truly poetical, the others hiſtorical.

The pictures are all of the ſame height, viz. eleven feet ten inches; and the firſt, ſecond, fourth, and fifth, are fifteen feet two inches long; the third and ſixth, which occupy the whole breadth of the room, at the North and South ends, are each forty-two feet long.

Between the upper edge of the Pictures, and the cornice of the room, runs a ſcroll of palm branches, which, with the frames, are of burniſhed gold.

### FIRST PICTURE.

## ORPHEUS.

THE ſcenery of this Picture exhibits a view of a mountainous and deſert country; near the centre of the piece, is Orpheus,

pheus, holding in his left hand a lyre, and extending his right hand towards Heaven, repreſenting him as he really was, the founder of the Grecian Theology.

The ſtory of Orpheus has exerciſed the pencils of many Painters, who, by realizing the poetical metaphor, have overlooked every thing valuable in it; but Mr. Barry, inſtead of ſurrounding him with ſuch auditors as Trees, Birds, and wild Beaſts, has united in his character the Legiſlator, the Divine, and the Philoſopher, and has placed him in a wild and ſavage country, ſurrounded by people as uncultivated as the land they inhabit; whilſt he, as a meſſenger from the Gods, to whoſe manſions he ſeems pointing, is pouring forth ſongs of inſtruction, which he accompanies with the muſic of his lyre.

By the action of Orpheus, the ſong appears the principal, and the muſic an acceſſary part; his hearers, who are repreſented

preſented in what is called a ſtate of nature, are moſt of them armed with clubs, and clad in the ſpoils of wild beaſts; alluding to their being poſſeſſed of courage and ſtrength to ſubdue lions and tigers, but wanting wiſdom and ſkill to prevent retaliation on themſelves, or their feeble offspring. This latter circumſtance is finely illuſtrated, by a woman at ſome diſtance, on the other ſide of a river, milking a goat, her two children ſitting near her, at the entrance of their habitation, a cave, where they are but poorly fenced againſt a lion, who diſcovers them, as he is prowling about for prey: ſtill further in the diſtance, are ſeen two horſes, one run down by a tiger; by this incident is clearly pointed out, that the want of human culture is an evil, which extends beyond our own ſpecies, to all animals intended for domeſtication, and which have no other defence than the wiſdom and induſtry of man.

It is a circumſtance often obſerved by travellers, that the value and eſtimation of women increaſes according to the growth and cultivation of ſociety, and that, among ſavage nations, they are in a condition little better than beaſts of burden; all offices of fatigue and labour, war and hunting excepted, being reſerved for them. It is to prove the truth of this obſervation, that a woman is leaning on her male companion, and carrying a dead fawn on her ſhoulder. As Orpheus is ſaid to have taught the uſe of letters, the theogony or generation of the Gods, and the worſhip due to them, there are placed near him, papers, the mundane egg, a lamb bound, a fire kindled, and other materials of ſacrifice; in the extreme diſtance, Ceres appears as juſt lighting on the world. The countenances of thoſe ſavages, who are ſuppoſed to have profited by the divine leſſons of Orpheus, are happily contraſted with thoſe of another group, who have not yet

yet attended to his doctrine, and ſhew, with peculiar energy, the effect of thoſe benefits which accrue to mankind from philoſophy and religion.

## SECOND PICTURE.

## A GRECIAN HARVEST-HOME.

THE warm glow of colouring ſpread over this Picture, and the elegance of the figures in the more conſpicuous parts of it, form a ſtriking and beautiful contraſt to the Picture already deſcribed. The ſeaſon is, as the title expreſſes, that of harveſt; and as moſt of the perſons repreſented are employed in rural ſports, the evening is choſen, as the moſt proper for ſuch relaxation from the labours of the field.

In the fore-ground is a double terminal figure of Sylvanus and Pan, with their proper attributes; round which, young

men and women, in beautiful forms, and lightly habited, are dancing to the muſick of a rural pipe, and ſeem, in the language of the Poet, to

" ———trip it as they go
" On the light fantaſtic toe."

Behind them, are oxen with a load of corn, and other characteriſtic emblems of the ſeaſon of the year. On one ſide of this happy group, appears the father, or maſter of the feaſt, with a fillet round his head, and in his hand a ſtaff; with him, his aged wife, as entering to behold and partake of the feſtivity of the ſcene.

In the oppoſite corner of the picture, are ſome ruſtics ſitting, with the fruits of the earth, and implements of huſbandry, near them: theſe might ſerve as a foil, if any foil were neceſſary, to the beautiful dancing figures already deſcribed.

The diſtant parts of this pleaſing picture, exhibit a view of a fertile cultivated country, with a farm-houſe,

near

near which, there are men wreſtling: one of the lookers-on has a *diſcus* under his arm; and aged men are ſitting and lying along, diſcourſing, and enjoying a view of thoſe athletic ſports, in which they can no longer engage. Here alſo are ſeen the various employments of a country life, as binding corn, tending bees, courtſhip, marriage, and a number of children every where; in ſhort, whatever can beſt point out a ſtate of happineſs, ſimplicity, and fecundity; in which, though not attended with much *éclat*, the duty we owe to God, our neighbours, and ourſelves, is perhaps much better attended to, than in any other ſtate of life. Still further to embelliſh this picture, the Artiſt has introduced, ſitting on a pent-houſe, a peacock in fine plumage; and at the top of the picture, Ceres, Bacchus, Pan, &c. are looking down on the innocent feſtivity of their happy votaries: behind them is a limb of the zodiac,

with the ſigns Leo, Virgo, and Libra, which mark the ſeaſon of the year.

### THIRD PICTURE.

## THE VICTORS AT OLYMPIA.

IN this ſuperb Picture, the Artiſt has happily choſen that point of time, when the Victors in the ſeveral games are paſſing in proceſſion, before the Hellanodicks, or Judges, where they are crowned with olive, in the preſence of all the Grecians. At the right-hand corner of the piece, the three Judges are ſeated on a throne, ornamented with medallions of Solon and Lycurgus; and with trophies of the victories of Salamis, Marathon, and Thermopyle. Near the foot of the throne, is a table, at which a perſon appears writing, on a ſcroll of parchment, the name, family, and country of the conqueror; near this table, a victor, in the foot-

foot-race, having already received a branch of palm, which he holds in his hand, is crowning by an inferior Hellanodick; next him is a foot-racer, who ran armed with a helmet, ſpear, and ſhield. Cloſe following is ſeen a manly group, formed of two young athletic figures, bearing on their ſhoulders their aged father; the one of theſe repreſents a Pancratiaſt, the other the victor at the ceſtus: the old man is Diagoras of Rhodes, who, having in his youth been celebrated for his victories in the games, has, in his advanced age, the additional felicity of enjoying the fruit of the virtuous education he has given his ſons, amidſt the acclamations of the people of Greece; ſome of whom are ſtrewing flowers around the old man's head, while one of his friends is graſping his right hand, and ſuppoſed to be making the celebrated ſpeech recorded on this occaſion, "Now, Diagoras, die, for "thou canſt not be made a God." A child has hold of the arm of one of the

victors, and is looking up, with joy in its countenance, at the honours conferred upon his parent: near this beautiful group are ſeen a number of perſons, the chief of whom repreſents Pericles, ſpeaking to Cymon. The Painter has, in the perſon of Pericles, introduced the likeneſs of the late Earl of Chatham. Next appears, in the front of the Picture, a horſe-racer, and cloſe to him, a chariot drawn by four horſes: in the chariot is Hiero of Syracuſe; round the chariot are ſeveral perſons, with muſical inſtruments, accompanied by many youths, forming a chorus, which is led by Pindar, playing on a lyre.

As, at one end of this Picture, there is a figure of Minerva in chiaro oſcuro; ſo, at the other end, is a ſtatue of Hercules, painted in the ſame manner; which are comprehenſive exemplars of that ſtrength of body and mind, which were the great objects of Grecian education. On the baſe of the ſtatue of Hercules, the

Artiſt

Artiſt has introduced his own portrait, holding in his hand a picture conformably to the hiſtory of Timanthus, as related by Pliny.

The diſtance in this capital Picture, is ornamented with a view of a beautiful Grecian temple, the town of Elis, and the river Alpheus, as truly characteriſtic of the ſpot on which the ceremony that forms the ſubject of the picture, may be ſuppoſed to have been performed.

### FOURTH PICTURE.

## THE THAMES.

THE practice of perſonifying rivers, and repreſenting them by a Genius, adapted to their peculiar circumſtances, is as ancient as the arts of Painting and Sculpture; and in conformity to this practice, the ingenious Artiſt has in this picture repreſented the Thames, of a venerable, majeſtic,

majeſtic, and gracious aſpect, ſitting on the waters in a triumphal car, ſteering himſelf with one hand, and holding in the other the Mariner's Compaſs, by the uſe of which, modern navigation connects places the moſt remote, and has arrived at a certainty, importance, and magnitude unknown to the ancient world. The car is borne along by our great navigators, Sir Francis Drake, Sir Walter Raleigh, Sebaſtion Cabot, and the late Captain Cook, of amiable memory: in the front of the car, and apparently in the action of meeting it, are four figures, repreſenting Europe, Aſia, Africa, and America, ready to lay their ſeveral productions in the lap of the Thames.

Sir John Denham, in his celebrated eulogium on this River, has expreſſed this circumſtance very happily.

" Nor are his bleſſings to his banks
" confin'd,
" But free and common, as the ſea or
" wind,

" When

" When he, to boaſt, or to diſperſe his
" ſtores,
" Full of the tributes of his grateful
" ſhores,
" Viſits the world, and, in his flying
" tow'rs,
" Brings home to us, and makes both
" Indies ours;
" Finds wealth where 'tis, beſtows it
" where it wants;
" Cities in deſerts, woods in cities
" plants.
" So that to us no thing, no place is
" ſtrange,
" While his fair boſom is the world's
" exchange."

Over-head is Mercury, the emblem of Commerce, ſummoning the nations together; and following the car, are Nereids, carrying ſeveral articles of the manufactures of Mancheſter, Birmingham, &c. The ſportive appearance of ſome of theſe Nereids, gives a variety to the picture, and is intended to ſhew, that an extenſive com-

commerce is ſometimes found ſubverſive of the foundations of virtue.

In this ſcene of triumph and joy, the Artiſt has introduced Muſic, and, for this reaſon, has placed among the Sea-Nymphs his friend Dr. Burney, whoſe abilities in that line are univerſally acknowledged.

In the diſtance is a view of the Chalky Cliffs on the Engliſh coaſt, with ſhips ſailing, highly characteriſtic of the commerce of this country, which the picture is intended to record.

## FIFTH PICTURE.

## THE SOCIETY.

THIS Picture repreſents the diſtribution of the rewards in the Society, founded for the noble purpoſe of introducing and perfecting thoſe uſeful Arts in this country,

try, for which we were formerly obliged to have recourſe to other nations. Not far advanced from the left ſide of the Picture, ſtands Lord Romney, the Preſident of the Society, habited, as all the other Noblemen are, in the robes of his dignity: near the Preſident ſtands his Royal Highneſs the Prince of Wales; and ſitting at the corner of the Picture, holding in his hand the inſtrument of the Inſtitution, is Mr. William Shipley, "whoſe public "ſpirit gave riſe to this Society."* One of the Farmers who are producing ſpecimens of Grain to the Preſident, is Arthur Young, Eſq. near him is Mr. More, the preſent Secretary, diſtinguiſhable by the pen he holds. On the right hand of Lord Romney, ſtands the Hon. Charles Marſham, V. P. and on the left, Owen Saluſbury Brereton, Eſq. V. P. Towards the center of the Picture is ſeen that diſtin-

* Theſe words are engraven on the Gold Medal voted to Mr Shipley in the year 1758.

that diſtinguiſhed example of female excellence, Mrs. Montague, who appears recommending the ingenuity and induſtry of a young female, whoſe work ſhe is producing. Near her are placed the late Ducheſs of Northumberland, Earl Percy, V. P. Joſhua Steele, Eſq. V. P. the late Sir George Savile, Bart. V. P. Dr. Hurd, Biſhop of Worceſter, Soame Jennings, and James Harris, Eſqrs. and the two Ducheſſes of Rutland and Devonſhire: between theſe Ladies, the late Dr. Samuel Johnſon ſeems pointing out this example of Mrs. Montague, to their Graces attention and imitation.

Farther advanced is his Grace the Duke of Richmond, V. P. and near him Edmund Burke, Eſq. Still nearer the right-hand ſide of the Picture, is Edward Hooper, Eſq. V. P. and the late Keane Fitz Gerald, Eſq. V. P. His Grace the Duke of Northumberland, V. P. the Earl of Radnor, V. P. William Lock, Eſq. and Dr. William Hunter, are examining

ſome

ſome drawings by a youth, to whom a premium has been adjudged: behind them is another youth, in whoſe countenance the dejection he feels at his being diſappointed in his expectation of a reward, is finely expreſſed. Near the right ſide of the piece are ſeen, the Lord Viſcount Folkſtone, firſt Preſident of the Society, his ſon the late Earl of Radnor, V. P. and Dr. Stephen Hales, V. P. In the back ground appears part of the water-front of Somerſet Houſe, St. Paul's, &c. ſerving to characterize this, as the Society inſtituted at London. And, as a very large part of the rewards beſtowed by the Society, have been diſtributed to promote the Polite Arts of Painting and Sculpture, the Artiſt has alſo moſt judiciouſly introduced a Picture and a Statue: the ſubject of the Picture is the Fall of Lucifer, deſigned by Mr. Barry, when the Royal Academy had ſelected ſix of the members to paint Pictures for St. Paul's Cathedral; the Statue is that of the Grecian Mother dying,

and

and in thoſe moments attentive only to the ſafety of her child.

### SIXTH PICTURE.

## ELYSIUM, OR THE STATE OF FINAL RETRIBUTION.

IN this ſublime Picture, which occupies the whole length of the Room, the Artiſt has, with wonderful ſagacity, brought together thoſe great and good men of all ages and nations, who have acted as the cultivators and benefactors of mankind. This Picture is ſeparated from that of the Society diſtributing its rewards, by palm-trees; near which, on a pedeſtal, ſits a pelican, feeding its young with its own blood; a happy type of thoſe perſonages repreſented in the picture, who had worn themſelves out in the ſervice of mankind. Behind the palms, near the top of the picture, are indiſtinctly

diſtinctly ſeen, as immerſed and loſt in the great blaze of light, Cherubims veiled with their wings, in the act of adoring and incenſing ſomething not ſeen above them, and out of the Picture, from whence the light and glory proceeds, which are diffuſed over the whole peice. By thus introducing the idea of the divine eſſence, by effect, rather than by form, the abſurdity committed by many Painters is happily avoided, and the mind of every intelligent ſpectator is filled with awe and reverence. The firſt group in this picture, conſiſts of Roger Bacon, Archimedes, Deſcartes, and Thales; behind them ſtand Sir Francis Bacon, Copernicus, Gallileo, and Sir Iſaac Newton, who are looking at a Solar Syſtem, which two Angels are unveiling and explaining to them: near the inferior Angel is Columbus, and cloſe to him, Epaminondas, Socrates, Cato the younger, the elder Brutus, and Sir Thomas More; a Sextumvirate, to which, Swift ſays, all ages have

not been able to add a ſeventh. Near Brutus is Mr. William Molyneux; and behind Columbus is Lord Shafteſbury, John Locke, Zeno, Ariſtotle, and Plato; and in the opening between this group and the next, are Dr. William Harvey, the diſcoverer of the circulation of the blood, and the Honourable Robert Boyle. The next group are Legiſlators, where King Alfred the Great is leaning on the ſhoulder of William Penn, who is ſhewing his Code of Laws to Lycurgus. On the other ſide of Penn ſtand Minos, Trajan, Antoninus, Peter the Great of Ruſſia, Edward the Black Prince, Henry the Fourth of France, and Andrea Doria of Genoa. Here too are introduced thoſe Patrons of Genius, Lorenzo de Medicis, Louis the Fourteenth, Alexander the Great, Charles the Firſt, Colbert, Leo the Tenth, Francis the Firſt, and the Earl of Arundel: juſt before this group, on the rocks which ſeparate Elyſium from the Infernal Regions, are placed the Angelic

gelic Guards, ſee Milton, book IV. verſe 549; and in the moſt advanced part an Arch-Angel, whoſe countenance and action bear evident marks of concern, is weighing what is not ſeen: behind this figure is another Angel, explaining ſomething to Paſcal and Biſhop Butler.

Behind Francis the Firſt and Lord Arundel, are Hugo Grotius, Father Paul, and Pope Adrian.

Near the center, towards the top of the Picture, ſits Homer; on his right hand, Milton; next him, Shakeſpeare, Spencer, Chaucer, and Sappho; behind her ſits Alcæus, who is talking with Oſſian; near him are Menander, Moliere, Congreve, Bruma, Confucius, Mango Capac, &c. Next Homer, on the other ſide, is the Archbiſhop of Cambray, with Virgil leaning on his ſhoulder; near them, Taſſo, Ariſto, and Danté; behind Danté, Petrarch, Laura, Giovanni, and Boccacio. In the ſecond range of Figures, over Ed-

ward the Black Prince and Peter the Great, are Swift, Eraſmus, and Cervantes; near them, Pope, Dryden, Addiſon, and Richardſon; behind Dryden and Pope are Sterne, Gray, Goldſmith, Thomſon, and Fielding; and near Richardſon, Inigo Jones, Sir Chriſtopher Wren, and Vandyke; next Vandyke is Rubens, with his hand on the ſhoulder of Le Seur; behind him is Le Brun; next are Julio Romano, Dominichino, and Annibal Carrachi, who are in converſation with Phidias, behind whom is Giles Huſſey. Nicolas Pouſſin and the Sicyonian Maid are near them, with Callimachus, and Pamphilus: near Apelles is Corregio; behind Raphael ſtand Michael Angelo, and Leonardo da Vinci; and behind them Ghiberti, Donatello, Maſſachio, Brunaleſchi, Albert Durer, Giotto, Cimabue, and Hogarth.

In the top of this part of the Picture, the Painter has happily glanced at what is called by Aſtronomers, the *Syſtem of Syſtems*, where the fixed ſtars, conſidered as ſo many

many ſuns, each with his ſeveral planets, are revolving round the *Great Cauſe* of all things; and repreſenting every thing as effected by *Intelligence*, has ſhewn each ſyſtem, carried along in its revolution by an Angel. Though only a ſmall portion of this circle can be ſeen, yet enough is ſhewn to manifeſt the ſublimity of the idea.

In the other corner of the Picture, the Artiſt has repreſented Tartarus, where, among cataracts of fire and clouds of ſmoke, two large hands are ſeen, one of them holding a fire-fork, the other pulling down a number of Figures, bound together by ſerpents, repreſenting War, Gluttony, Extravagance, Detraction, Parſimony, and Ambition; and floating down the Fiery Gulph, are Tyranny, Hypocriſy, and Cruelty, with their proper attributes; the whole of this excellent Picture proving, in the moſt forcible manner, the truth of that great maxim, which has been

already quoted, but cannot be too often inculcated:

THAT THE OBTAINING HAPPINESS, AS WELL INDIVIDUAL AS PUBLIC, BOTH IN THIS WORLD AND HEREAFTER, DEPENDS ON CULTIVATING THE HUMAN FACULTIES.

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AFTER this account and deſcription of the Pictures painted by Mr. Barry, there remains only to ſtate the ſums expended by the Society on this occaſion, with a view, not ſo much to the ornamenting the Room in which their meetings are held, as to prove to the world, in the moſt convincing manner, that the elegant Arts are not confined to any country, but that, under due encouragement and protection, they will proſper as well in England as in the warmer climate of Italy.

*Expen-*

*Expenditure on account of the Pictures painted by Mr. Barry.*

| | £. | s. | d. |
|---|---|---|---|
| For canvas, colours, frames, and other incidental charges — — | 315 | 2 | 0 |
| Expence of two exhibitions, including catalogues, | 224 | 0 | 0 |
| | 539 | 2 | 0 |

Beſides the Pictures already mentioned, the Room is ſtill further ornamented by two whole-length Portraits; the one, painted by Mr. Gainſborough, of the Lord Viſcount Folkſtone, the firſt Preſident of the Society; the other, painted by Sir Joſhua Reynolds, of Lord Romney, the preſent Preſident. On the South ſide of the Room are (preſented by John Bacon, Eſq. R. A.) two Caſts in plaſter from ſtatues, the one of Mars, the other of Venus, deſigned and executed in marble by that excellent Artiſt, and for which

two Premiums offered by the Society, for promoting the art of Statuary in this country, had been adjudged to him; and over one of the chimnies is a Clock of a curious conſtruction, the gift of the late Mr. Thomas Grignion; and over the other chimney, a Buſt of His Royal Highneſs the Prince of Wales, by Mr. J. C. Lochée: on the North ſide of the Room are two Buſts, preſented by Monſ. De la Blancherie; the one, of the late Dr. Benjamin Franklin, formerly an active Member of this Society; the other, of Monſieur Perronet: and over the Chair, a Miniature of Mr. W. Shipley, painted and preſented by Mr. W. Hincks.

# PAPER

IN

# MANUFACTURES.

# MANUFACTURES.

IN the year 1760 the Society offered premiums for making cloth from Hop-Stalks, or Bines, and ſubjoined to the Advertiſement ſome directions to be purſued in preparing the Stalks, and obtaining the fibres in a fit ſtate for manufacturing. No proper claim was ever made for theſe premiums; but as the want of ſucceſs ſeems to have ariſen, not ſo much from the impracticability of doing it, the practice being known and in uſe in Sweden, as from the want of proper informationr eſpecting the conducting the proceſs; it has been judged proper to print the following Letter, which may ſerve to ſtimulate ingenious perſons to make further trial of a material produced in ſuch great quantities in this kingdom, and hitherto employed to no profitable purpoſes; and as a ſtill greater inducement,

ment, the Society have again offered a premium for the making cloth from Hop-ſtalks, as may be ſeen in this volume, under the head of Premiums for encouraging and improving Manufactures.

The proceſs alluded to in the following letter was publiſhed by the Society in 1760, as follows:

"The Hop-ſtalks or bines are to be "collected in autumn, put into water "and covered therewith the whole win-"ter; in March they are to be taken "out, dried in a ſtove, and dreſſed as "Flax. The prepared filaments will be "fine, ſoft, and white, and may be "ſpun into cloth. Hop-ſtalks require a "longer time to rot than Flax; and if "not completely macerated, the woody "part will not ſeparate, nor the Cloth "prove white or fine."

But theſe directions having been found inadequate to the purpoſe intended, the Society, in ſome ſubſequent publications, added

added the following *Nota Bene* to their Advertiſements. " It not being exactly " known how long time the Hop-bines " require to be ſteeped in water, in the " manner Hemp is, in order to ſeparate " the fibrous parts from the reſt, it is " recommended to the candidates for " the premium, to examine the Hop- " bines from time to time, during their " ſteeping, and to take them out, before " the fibres appear to be too much weak- " ened for the uſe intended; they are " then to be dried, on a kiln, or in ſome " other way; and it is required of each " candidate to produce to the Society an " exact account of the manner of treat- " ing the Hop-bines."

*London*

*London, December 14th, 1761.*

SIR,

HAVING attempted the making Cloth from Hop-ſtalks, in purſuance of the premium and proceſs publiſhed by the Society, I have, by deſire of ſeveral Members, left ſome ſpecimens of the manufacture with the Regiſter. I beg leave to trouble you with an obſervation or two that may be proper to be attended to, if this ſubject ſhould again be taken into conſideration.

Firſt, That the ſaid ſpecimens are ſufficient to evince that Hop-bines will afford a material for making cloth.

Secondly, That the ſpecies of cloth intended to be made from the material produced, would very well anſwer the purpoſe of fine ſacking, and coarſe bagging for Hops.

Thirdly,

Thirdly, That the ſole cauſe of my not producing a ſtronger material, and a ſufficient quantity to have entitled me to the premium propoſed, was, that the material was too long immerſed under water, and its texture was thereby deſtroyed.

Fourthly, That ſuch bines as I took occaſionally from the large quantity I had put to ſoak, at the end of about ſix weeks or two months, afforded filaments ſufficiently fine and ſtrong for any purpoſe.

Fifthly, That the time neceſſary to reduce the inner ſubſtance of the Hop-bines to a fitneſs for uſe by maceration, will abſolutely decay the outer coat, as appears from thoſe which have continued under water above a year.

My attempts and endeavours in this matter fall very ſhort of the ſucceſs and perfection hoped for by the Society and myſelf,

myſelf, and allow me no pretence for claiming the premium propoſed.

I am, Sir,

Your moſt obedient,

Humble Servant,

H. COOKSEY.

To Dr. TEMPLEMAN,
Secretary to the Society for Encouragement of Arts, Manufactures, and Commerce.

# PAPERS IN MECHANICKS.

# MECHANICKS.

IN the year 1776, Mr. William Shipley, of Maidſtone, whoſe benevolence is univerſally known and acknowledged, and who has already been mentioned in this volume, page 125, preſented to the Society a contrivance, called by him *a Floating Light*, for ſaving the lives of perſons who fall over-board in the night: this contrivance appearing to the Society ingenious, and the intention humane, the Society voted their thanks and a ſilver medal to Mr. Shipley, who left with them one of the floating lights, which is preſerved in the Society's repoſitory, and of which the following is a deſcription.

The machine conſiſts of a kind of boat made of tin-plates, two feet four inches long, twelve inches wide, and twelve inches deep: the cover of this boat is ſol-

dered down, ſo that the whole cavity is water and air tight; but, leſt by any accident the boat ſhould be bulged, and conſequently ſunk in the water, the inſide is filled with bladders blown up with air: if therefore a hole ſhould chance to be beaten through the ſide, one or two of the bladders at moſt would be injured, and the remainder would be ſufficient to keep the machine floating on the water. That any unfortunate perſon who falls over-board in the night may have an opportunity of diſcovering the machine, there riſes from the cover or deck of the boat four upright pieces of tin, ſerving to ſupport a circle which is ſoldered to them; within this circle is another, moving on two axes, in the manner ſea-compaſſes are hung, and ſupporting the lanthorn, which is thus kept in its perpendicular poſition, notwithſtanding any irregular motion of the boat. There are alſo fixed to the ſides of the boat two projecting handles for the perſon to lay hold of, in order

order to ſupport himſelf till he is brought to the ſhip's ſide by the means of a rope, which being made faſt to the tin boat, and the other end remaining on board the ſhip, the people may with eaſe hawl the apparatus and man towards them.

Thus far may ſerve as a general deſcription of the floating light; but in order to facilitate the ſaving the man, another contrivance is added, conſiſting of a lanthorn, to be let down from the ſhip by a rope, and having a rope-ladder faſtened to it, whoſe uſes are more fully deſcribed in the annexed paper, as ſent by Mr. Shipley with the machine.

It may be proper to obſerve that, to prevent the light in the lanthorns being put out by the ſpray of the ſea, their tops are made double, which, though they are pierced full of holes for the purpoſe of admitting air, will effectually prevent that accident.

*An Account of the Uſe of a* FLOATING LIGHT, *calculated to ſave the lives of ſuch perſons as have the misfortune to fall over-board in the night.*

IT is propoſed, in order to make this float uſeful, that it be every night under the care of thoſe officers who are on the watch, and that its lamp be frequently trimmed and ſupplied with freſh oil, and its ſnuff moiſtened with oil of turpentine, that it may take fire with the leaſt touch of a lamp or candle; and whenever the ſhip is alarmed by any of the ſailors falling over-board in the night, the officer on watch may light the lamp in the lanthorn belonging to the float as expeditious as poſſible, and let the float down by the ſmall cord into the water, till it has floated about one ſecond of time, and the float is a little way out of the perpendicular of the ſmall cord; he is then to faſten the cord to the reel for

the line, and toſs it over-board, which will ſink down and pull the line almoſt perpendicular: and thus it will not be liable to entangle the perſon when he ſwims to the float, who, when he has got hold of the handles of it, may move it very faſt which way he will, only by ſtriking his legs in the ſame manner as he does when he ſwims; and as the light of the lamp will be a certain direction for the perſon over-board to find the float, ſo it will alſo direct them in the ſhip to find the man and float. And when the ſhip has tacked about, and is come to the float, then the following method is propoſed, to take up the man and float into the ſhip, viz. the lanthorn with the rope-ladder may be let down from the end of a pole with a cord and pulley, till the croſs bar below the lanthorn touches the water, which may be ſeen by them in the ſhip by means of the light from the bottom of the lanthorn, and thus the man in the water may lay hold of the

croſs bar, and fix his feet on one of the ſteps of the rope-ladder; and he may then lay hold of the iron-bale of the float with one hand, and hang it on the hook of the rope above the croſs bar; which being done, by the help of a pulley faſtened to the end of a pole, the man and float may be both ſafely lifted into the ſhip.

*Maidſtone, Jan. 7th, 1777.*

GENTLEMEN,

I have received the ſilver medal which you were pleaſed to order me for contriving a floating light, calculated to ſave the lives of them who fall over-board in the night at ſea, which I ſupppoſe may ſerve as a hint for ſome mechanick artiſt who is well verſed in ſea affairs to improve from, by making a floating light ſo perfect as to anſwer all its wiſhed-for purpoſes.

This medal from you is by me more eſteemed than a very conſiderable pecuniary

niary reward would be from any other body of gentlemen; and I believe that nothing can give me more pleaſure than this honorary mark of your approbation has done, unleſs it is to hear that my floating light is ſhortly uſed at ſea, and is a means of ſaving the lives of ſeveral of that claſs of people whom all maritime Powers eſteem very valuable members of ſociety, and that it may then be ranked amongſt the many uſeful contrivances that have been introduced to the Public under your patronage.

I am, with the greateſt regard,

GENTLEMEN,

Your very humble Servant,

WILLIAM SHIPLEY.

*To the Society for the Encouragement of Arts, Manufactures, and Commerce.*

If any perſon, deſirous of conſtructing a machine for this humane purpoſe, ſhould find the foregoing deſcription wanting in any particulars, he may eaſily examine the complete apparatus which was preſented by Mr. Shipley, and is reſerved in the repoſitory of the Society for the uſe of the Public.

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IN the ſecond Volume of the Tranſactions, page 191, an account is given of the invention of the Gun-harpoon, and the means taken by the Society for promoting the uſe of it: the following certificate will ſtill further prove its utility, and ſhew that all the attention paid by the Society to the introduction of that kind of Harpoon, among the veſſels employed in the Greenland fiſhery, has anſwered every expectation the Public entertained of it.

I, Sin-

I, Sinclear Halcrow, Mate and Harpooner of the Ship Marianne, Captain William Brown, on the twenty-eighth day of June laſt, in latitude ſeventy-nine North, perceived a Whale at about three hundred yards diſtance from the boat, which we immediately purſued.

The fiſh ſwan about five hundred yards, and had nearly eſcaped by ſinking ſtern or tail foremoſt, and was entirely under water, except about four feet of her head, when I fired a harpoon from a ſwivel-gun fixed to the bow of the boat, which ſtruck the fiſh in the crown-bone of the head, into which it entered about four inches: the fiſh was much ſtunned, and lay motionleſs a little under the ſurface of the water, about a minute, when ſhe ſunk herſelf entirely, and ran out ſix lines, each containing upwards of one hundred and forty fathom: in about a quarter of an hour ſhe appeared above water, at nearly three quarters of a mile diſtant from the boats, which having

having approached her, ſhe ſtruck one of them a blow with her tail, which broke her keel in two, and ſtove ſeveral of her planks, by which the boat immediately filled with water, and the people were ſaved by the other boats, and carried to a piece of ice, where they remained till the fiſh was killed.

The fiſh went down again, and ſtaid under water but a ſhort ſpace: when ſhe came up, ſhe appeared in great agonies, and flounced and beat herſelf about, ſo as frequently to render any approach to her extremely dangerous; in a ſecond attempt ſhe ſtove another boat, but not ſo as to render it entirely uſeleſs.

The harpooner of this ſecond boat fixed a hand-harpoon in her; and having by this time plenty of aſſiſtance from the ſhips Achilles and Induſtry, belonging to the ſame owners, they fixed three other harpoons into her, and ſeveral lances, which enabled us to kill her, about four hours after ſhe was firſt ſtruck.

This

This fiſh meaſured from her noſe to her tail near ſeventy feet: her jaw-bones, which now lie in Greenland Dock, meaſure twenty-ſeven feet. She filled ſixty butts of blubber; her principal bone meaſured twelve feet and a half, and weighed twenty-ſix hundred weight.

It would have been utterly impoſſible to have ſecured this fiſh without the aid of the gun-harpoon; and if we had had another gun and harpoon in any of the other boats, the fiſh might have been killed in a fourth part of the time, and that without any danger to the lives of the men.

The above I declare to be in every particular ſtrictly true.

SINCLEAR HALCROW.

*Lower Shadwell,*
*Dec.* 17, 1783.

In conſequence of this certificate, Mr. Halcrow received two guineas, offered as a premium for ſtriking a Whale by the gun-harpoon in the year 1783.

THE

THE gold medal, or twenty guineas, having been offered as a premium for the beſt Crane for Wharfs, was adjudged to Mr. John Braithwaite, who choſe the gold medal, and of whoſe Crane the following is a deſcription.

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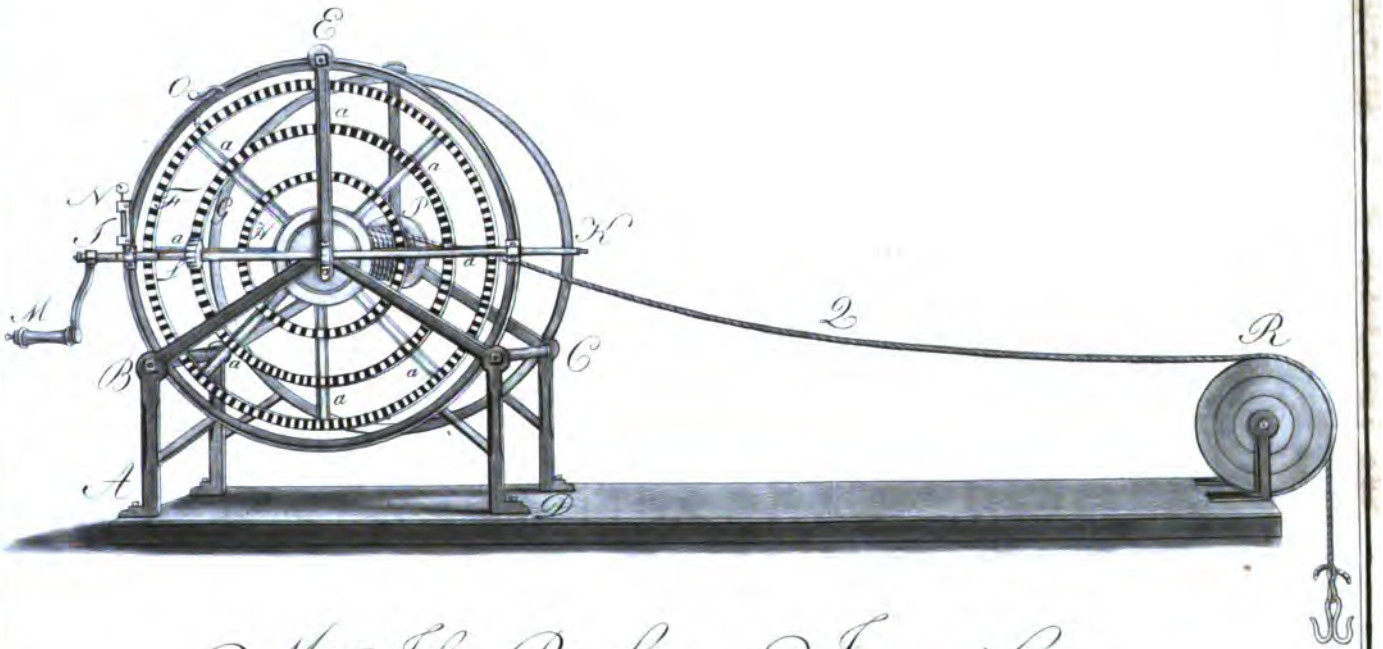
THE frame, which is wholly of caſt iron, is formed of two circles, held together by three ſcrewed bars, and ſtanding on four feet; the crane wheel, which is encloſed within the frame, conſiſts of three concentric toothed-face wheels, joined together by ſtrong bars, whoſe axle is the barrel on which the rope is coiled: in the front of the face-wheels runs a ſhifting arbor; on this arbor is a pinion, which may be brought to work in the teeth of either of the face-wheels, and thereby the power employed at the wynch may




Mr. John Braithwaite's Improved Crane.

may be applied to raiſe a greater or leſſer weight occaſionally.

The model produced in claim of the premium is reſerved in the Repoſitory of the Society, for the inſpection of the Public.

*Deſcription of the Plate of* Mr. JOHN BRAITHWAIT's *improved Crane.*

*A B C D E*, a frame of caſt iron; *F G H*, three concentric face wheels, united together by the eight ſtraight bars, *a a a*. *I K*, a ſliding arbor, on which is fixed the pinion *L*. *M*, the wynch or handle. *N*, a ſtop, which when lifted up permits the ſliding arbor to be moved backward or forward, but, when down, retains it in its proper place. *O*, a pall or ſtop, which prevents the crane running back, but may be diſcharged at pleaſure. *P*, the barrel on which the rope is coiled. *Q*, the rope paſſing over the pulley, *R*.

*A ſhort*

*A ſhort Account and Deſcription of Mr.* MARSHAL'*s ſecret* ESCUTCHEON, *for which the Society voted him a bounty of ten guineas, February the 4th,* 1784.

THE Marquis of Worceſter, in his Century of Inventions, No. 72, after having ſpoken of three kinds of locks invented by him, ſays, "an eſcutcheon to be placed "before any of theſe locks, with theſe "properties:

"The owner, though a woman, may "with her delicate hand vary the ways "of coming to open the lock, ten millions "times beyond the knowledge of the "ſmith that made it, or of me who in-"vented it."

Many attempts have been made to form a machine equal in its properties to the deſcription here given, and from thence it

it is probable, aroſe the kind of padlock which have been long made in this country in great numbers, which having ſeveral letters on different rings, can only be opened when a certain ſet of thoſe letters are arranged in one order: but this was in no degree equal to the end propoſed; for, beſides the workman who made it being at all times informed of the poſition the letters muſt be in, and conſequently enabled to open it, the letters and rings admitting of no variation of place, at the will of the owner, reſerving at the ſame time a power of opening the locks, whenever the proper arrangement became known, the ſecret was divulged, and all ſecurity at an end: but by the improvement made by Mr. Marſhall, the letters or figures allowing an almoſt infinite variety of changes, the owner may, in one minute, alter the ſecret in ſuch a manner, that even the maker would be as unlikely to open it, as he would be of gaining the higheſt prize in a lot-

tery, by the chance of a ſingle ticket. Thus this kind of eſcutcheon is infinitely more ſecure than any hitherto in uſe, eſpecially as the alteration of the letters may be made every day for years, without recurring to their firſt ſtate; and as the owner may at one time chuſe to truſt a friend or a domeſtic with the ſecret, ſo that they might have recourſe to his valuables, &c. he may alſo, at another time, wiſh to exclude them from that privilege, which this contrivance renders very eaſy to be done. As this improvement relates only to the eſcutcheon, it is obvious that every attempt to pick the lock it covers, or to open it by means of falſe keys, is prevented; a circumſtance of no ſmall importance, when locks of a curious conſtruction, and when a number of fine wards, are made uſe of.

The eſcutcheon for which the bounty was given is reſerved in the Repoſitory of the

Fig 1

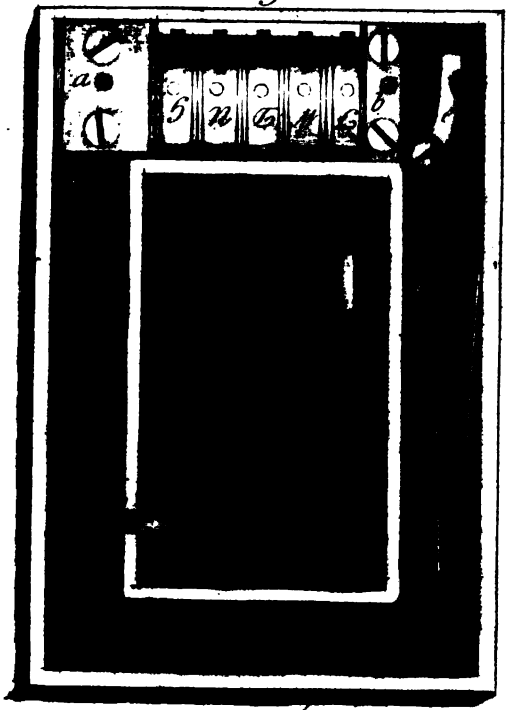
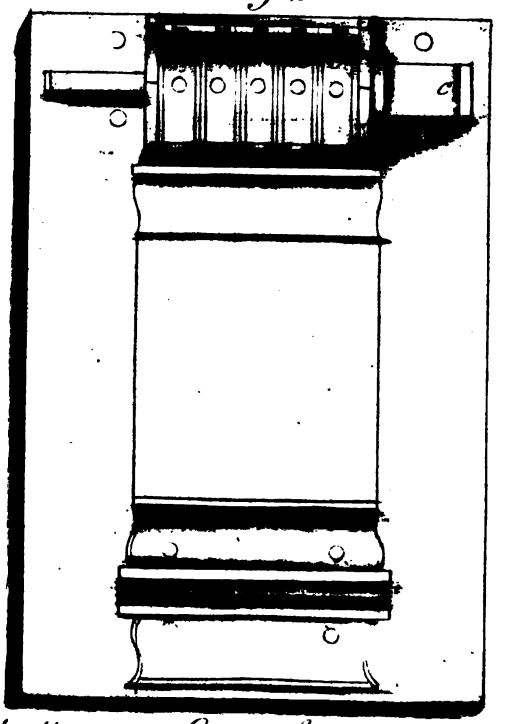
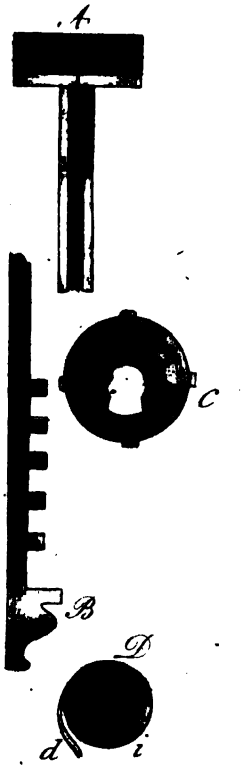



Fig 2




Mr. Timothy Marshall's secret Escutcheon.

the Society, for the inſpection of the Public.

## *Deſcription of the Plate of Mr. Marſhall's ſecret Eſcutcheon.*

*A*, the barrel in which the bar *B* ſlides: part of this barrel is concealed within the rollers, but the ends of it appear at *a* and *b*, fig. 1.

*B*, the bar with projecting teeth by which the rollers *C* prevent its being drawn back till the nick in the receſs is brought exactly over the tooth: the ſquare end of this bar is ſeen at *c*, fig. 2.

*C*, a roller, of which there are five, each compoſed of two circles, the outer circle having four rows of letters at equal diſtances engraved on its ſurface, with ſmall knobs, for the more commodiouſly turning the rollers round, the inner circle *D* being movable within the outer one on the barrel *A*: to the ſurface of each of the inner circles, is faſtened a ſmall

ſpring, *d* ſerving to keep the outer circle in its place, till an alteration in the poſition of the letters which are the foundation of the ſecret, is intended to be made; and within the inner circle is a receſs to prevent the bar *B* being drawn back, unleſs the teeth and the nick are in their proper ſituations, at which time, by drawing back the bar by the ſquare end, *c*, fig. 2. which is otherwiſe retained in its proper place by means of the feather-ſpring *b*, the catch *e*, fig. 1. is releaſed, and the door *f* of the eſcutcheon is thrown open by the ſpring, *g*.

When an alteration of the arrangement of the letters on which the ſecret depends, is deſired, the bar *B* muſt be held back by the ſquare end *c*, while one or more of the outer circles are turned round till the letters choſen are uppermoſt; the eſcutcheon cannot afterwards be opened till that ſame arrangement is again made, and ſo on according to whatever ſituation of the letters the owner may chooſe:

chooſe: hence it is evident that which ever of the letters have been choſen muſt, at the time of opening the eſcutcheon, be brought in one line to the upper ſurface of the rollers; and then the bar being drawn back, the door of the eſcutcheon will be thrown open.

Fig. 1. repreſents the under or inner ſide of the eſcutcheon, and fig. 2, the upper or outer ſide, and appears as when fixed over a lock, and covering the key-hole.

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*Nov.* 24, 1784.

THE ſilver medal was voted to Mr. Taylor, of Petworth, for his improvement of Latch Locks, of which the following is an account, extracted from his letter on that ſubject.

The latch, or ſpring bolt of door locks on the common conſtruction (whether

mortice, caſe, or rimmed locks) is very liable to be out of order, as ſoon as the oil is dried up between the tumbler and tail of the latch, from the erroneous manner in which the tumbler is made to act; and more eſpecially, when the lower arm of the tumbler is engaged, for then the friction is very great, and the bolt very hard to be moved. To remedy theſe defects, I beg leave to ſubmit to the judgement of the Society, a method I have lately thought of, and put in execution, of conſtructing, at a ſmall expence, the tumbler and tail of the latch or ſpring bolt, in ſuch manner, that the lock may be conſtantly uſed for many years, without any oil to thoſe parts, and always move alike both ways, that is, by turning the knob or handle either to the right or left, and with leſs force of the hand in turning it.

The alteration which conſtitutes the difference between this lock and thoſe in common uſe is, that the tumbler is reverſed,

verſed, ſo that the curved ſide of the tumbler act againſt two ſtubs fixed on the tail of the latch, and thruſts it eaſily back, whether the knob is turned to the right or left in opening the lock; behind the tail of the latch is alſo fixed a guide, having within it a groove, wherein runs a ſmall friction-wheel, ſerving to keep the latch in its direct ſituation, and leſſen its friction: the arms of the tumbler are not ſo long as they are generally made, becauſe the latch or ſpring bolt muſt move the eaſier by their being ſhorter.

By the above conſtruction, thoſe parts of the tumbler and tail of the latch, that are in contact, move in a line, the neareſt to the chord of a circle, whoſe radius is the arm of the tumbler, and conſequently paſs over the greateſt ſpace under the leaſt angle poſſible. The friction-wheel before-mentioned, being placed on a ſtub riſing from the tail of the latch, and in a line with the centre of the tumbler, and having the ſpring that puſhes the latch or bolt

forward, touching alſo in the ſame line with the friction-wheel, is a ſtill further improvement for all kind of latch locks, though low-priced locks will do very well according to this conſtruction without it.

It is preſumed the foregoing deſcription will enable any workman to make theſe locks; but leſt that ſhould not be the caſe, one of them is reſerved in the Society's Repoſitory, for the inſpection of the Public.

AN

AN

# ABSTRACT

OF THE

# PROCEEDINGS

OF THE

# SOCIETY,

In the YEAR M,DCC,LXXXIV.

# AGRICULTURE.

A LETTER from the Abbé Mann of Bruſſels, addreſſed to Sir Joſeph Banks, Bart. P. R. S. was communicated to the Society: in this letter a ſtraw Hive for Bees is deſcribed, conſiſting of two cylinders, ſeparated from each other by lattices invented by the Sieur Ricour, gardener to the Baron de Pœderli. The inventor commends this Hive above all others he has met with, for collecting the honey without deſtroying the Bees. It differs in ſome degree from thoſe employed in England for the ſame purpoſe, as may be perceived by examining a drawing ſent with the letter, and preſerved in the Society's collection.

The thanks of the Society were given to Sir Joſeph Banks and Abbé Mann, for his communication.

THE

THE thanks of the Society were given to Mr. Leatham, of Barton, near Malton, for an account of his method of planting quickſet hedges, on dry, gravelly, or thin ſoils. The cauſes which render quickſet hedges on ſuch ſoils poor and bad, the author conſiders to be, firſt, the ſetting them too low or flat on the ſurface, by which their roots only occupy a little depth of the ſoil: ſecondly, when ſet higher, they are generally too near the ſlope of the bank; hence they do not receive the benefit of the rain which falls on them. To remedy theſe inconveniencies, two lines are marked out, twelve feet diſtant from each other; from three feet within each line, the upper part of the ſoil is taken, and caſt into the centre of the ſpace, ſo as to form a flat bed, three feet broad, in the centre of which the quicks are planted; the remaining eighteen inches on each ſide are filled up with earth, gravel or ſand, taken out of the ditches on either ſide; this extends the

the bed to five feet, allowing ſix inches for the ſlope of the bank: the quicks planted in this body of ſoil, will find ſufficient nouriſhment, before the tap-root reaches the barren gravel below; and the earth thus placed, will retain ſufficient moiſture to nouriſh the plants. Quicks thus ſituated will, at an early age, form a fence, and, by raiſing the bank on each ſide higher at bleaſure, may, at a ſmall expence, be defended from the ill effects of ſharp winds, or the air of the ſea. The author ſays, it may be alledged, that the ſpace of land here allowed is extravagant; but as, on ſuch low-priced ground, it amounts to little, an ample compenſation is made, if a good and thriving fence is obtained. The work, agreeable to the ſaid dimenſions, coſt him fifteen pence per rood of ſeven yards in length.

THE

THE thanks of the Society were given to Nathaniel Jarman, Eſq. of Brenley-houſe, Kent, from whom the following letter was received, for having laid before the Society the largeſt root of Rhubarb hitherto produced, and for his great attention to the culture of Rhubarb in this country.

*Brenley Houſe, Oct.* 17, 1784.

SIR,

ON Friday laſt I ordered my gardener to take up a root of Rhubarb, produced from one of the ſeeds ſent by Dr. Mounſey, to the Society for the Encouragement of Arts, Manufactures, and Commerce, in 1764, and planted by my direction the ſame year.

Sixty ſeeds fell to my lot as a Member of of the Society, from which were produced forty-five plants, thirteen of which are ſtill remaining in the ground, and ſome of them annually produce ſeed. I have this year raiſed upwards of an hundred and

and twenty plants, in the common ground, from ſeeds of the preceding year. The two roots I ſent a few years paſt to the Society, one of them weighed twenty-eight, the other thirty pounds. The largeſt root I ever remember to have heard of being produced, was that taken up ſome years ſince by Sir Alexander Dick, which weighed forty-two pounds. The weight of the root now ſent being ſo much more than any before taken up, I requeſt you will lay it before the Society for their inſpection on Wedneſday next.

I am, Sir, &c.

NATHANIEL JARMAN.

N. B. The laſt root weighed four or five pounds leſs, a few days after it was taken out of the ground, than it did at the time of taking it up: I have therefore ſent a certificate of the weight of the root, which accompanies this letter.

To Mr. MORE. By

By the before-mentioned certificate, ſigned by Mr. Edward Jacob, Surgeon, at Feverſham, and dated October 16, 1784, it appeared, that the exact weight of the root was then fifty-ſix pounds; and the ſame root being again accurately weighed before a Committee on November the eighth, was found to weigh only forty-eight pounds.

A CLAIM was this year received for the premium offered for cultivating the greateſt quantity of *Rheum Palmatum*, or true Rhubarb: but the candidate not having fully complied with the terms of the Society's advertiſement, he was not entitled to the gold medal, being the premium offered; yet, in conſequence of the quantity planted, the ſilver medal was voted to him.

By the certificate ſent, it appeared that Mr. Robert Davis the Younger, of Minehead, in the county of Somerſet, merchant, had, in the ſpring of the year 1779, ſowed ſome ſeed of the *Rheum Palmatum*, or deeply-

deeply-indented-leaved Rhubarb, received from Dr. Brockleſby, of London, and that he had planted out ſeven hundred and twenty of the plants, at the diſtance of five feet aſunder. The ſoil in which they were planted, was for the moſt part ſandy and light, the reſt a deep black loamy garden-ground, both well expoſed. From the time of planting to that of the taking up, a great number of plants on the firſt ſoil decayed and died; from what cauſe, it is difficult to ſay: but thoſe on the latter continued for the moſt part luxuriant and vigorous, and produced larger roots than the other, although not ſuperior, if equal in quality; but it did not appear that the diſtance of five feet did in any reſpect incommode or injure the moſt luxuriant plants.

In the ſummer of 1783, the whole plantation above deſcribed was taken up; and although the number of roots could not be aſcertained, yet it was believed there were near, if not quite four hundred.

The whole produced three hundred pounds of dried Rhubarb.

THE thanks of the Society were given to Mr. Viſpré for two letters received from him on the cultivation of Vines for making wine in England,

In the firſt of theſe letters Mr. Viſpré, after obſerving that moſt Engliſh writers on gardening, have recommended the planting vineyards in England, and that the failure of thoſe plantations has probably ariſen from the too cloſely following the practice of countries ſituated in very different climates from that of England, mentions, that the late Mr. Hamilton, of Pains-Hill, whoſe vineyards were formerly well known, complains of two inconveniences he met with, viz. the frequent want of length of ſummer to ripen the grapes, and the ſtill more frequent blights in ſpring; and as ſtoves and mats have been found to prevent theſe inconveniences in ſmall, Mr. Viſpré propoſes to obviate

obviate them in the open ground, by training them along the ground itſelf, faſtening the branches down with pegs; and at the end of May, or in June, when the fruit begins to appear, he adviſes to follow the method purſued at Bergerac, which is to dig a hole under each bunch, and peg down the ſhoot, ſo that the bunch may hang in the hole, and be ſecure from roting: the earth ſhould be raiſed a little round the edge of the hole, to prevent the rain getting in. As an improvement of this method, he propoſes to cover the holes with tile, ſlate, or glaſs, by which means the grapes will ripen much better and ſooner than if expoſed to the open air. To prevent the blights on Vines, he ſays, as they are, according to his method to be trained along the ground horizontally, it will be very eaſy to protect them by coverings of hay, ſtraw, fern, &c.

In the ſecond letter, dated November the twenty-fourth, 1784, Mr. Viſpré informs the Society that he had tried

his method of cultivating Vines at a Vineyard at Chelſea; as ſoon as the bunches were formed, he covered them with pieces of tiles or ſlate; this cauſed them to bloſſom ſome days ſooner than thoſe that were expoſed; till the middle of June the covered Grapes viſibly grew faſter than the uncovered ones, when a cold rain came on, which held to the end of July, at which time it was found that the uncovered Grapes advanced faſter than the covered ones; which he ſuſpected to be owing to the moiſture that had penetrated into the ground, and hindered the growth of the latter. Notwithſtanding the ill ſucceſs of this experiment, Mr. Viſpré propoſes to renew his trials at another ſeaſon, and will relate the ſucceſs to the Society.

POLITE

## POLITE ARTS.

IN the ſecond Volume of theſe Tranſactions, page two hundred and forty, the attention paid by the Society to the obtaining correct Maps of the ſeveral Counties of this Kingdom has been mentioned; and this year a ſurvey of the County of Suffolk having been produced to them, the Gold Medal was voted to Mr. Joſeph Hodſkinſon for this ſurvey, which appeared by very ſatisfactory evidence to be accurately laid down, and neatly executed: and one of the Maps preſented by Mr. Hodſkinſon is reſerved in the Society's collection.

To Miſs Williams Thanks were given for producing to the Society a piece of Work in Cloth, repreſenting a dog.

Mr. Hurter, of Great Marlborough-Street, having ſubmitted to the conſider-

ation of the Society ſome Pictures painted by him in Enamel, in a manner nearly reſembling the method of painting in oil, which blends and unites the colours, and gives to the pictures the force and tranſparency of oil-paintings;

The Thanks of the Society were returned to Mr. Hurter for this communication, and as a mark of their approbation of his works.

Two boxes of Ink in cakes, made in imitation of Indian-Ink, the one by Mr. Reeves of Holborn Bridge, the other by Mr. Reeves of the Strand, having been produced to the Society, and trial made of them by ſome of the moſt celebrated artiſts, who all agreed the Ink was ſuperior to any hitherto made in England in imitation of Indian-ink;

Thanks were returned to the Meſſrs. Reeves for the communication, who were informed of the artiſts opinion; and the boxes

boxes preſented by them are reſerved in the Society's collection.

A box of Water-Colours in cakes was alſo preſented to the Society from Mr. Cowen of Dublin, to whom Thanks were ordered; and the box is reſerved in the Society's collection.

Mr. William Birch having produced to the Society ſome Pictures painted by him in Enamel, and alſo ſome proofs of a colour invented by him, which appeared likely to anſwer very good purpoſes in Enamel-painting, the Greater Silver Pallet was voted to him, and the proofs of his new colour reſerved for the inſpection of the Curious.

## MANUFACTURES.

A Pair of Ruffles, and a Shirt-boſom, were ſubmitted to the conſideration of the Society by Mrs. Plagavin, who had worked them entirely with needles in imitation of lace; and Thanks were returned to Mrs. Plagavin for the communication: but it appeared, on a full examination, that a manufacture on the principles on which theſe Ruffles, &c. are made, cannot be profitably eſtabliſhed in this kingdom.

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## MECHANICKS.

Mr. Maling, of Scarborough, having ſent to the Society an inſtrument contrived by him, and called *a Perpendicular*, to

to be uſed inſtead of a quadrant of altitude with the artificial globes; the Society voted him their Silver Medal for the ſame. With the inſtrument was ſent a deſcription of it, and ſeveral problems, to the ſolution of which it may be advantageouſly applied. This inſtrument, made of wood, conſiſts of a baſe concentric with the globe it is intended to be applied to, and muſt move ſo along the wooden horizon; an edge marked on the inſtrument (*a*), ſhewing the azimuth, or amplitude: from this baſe riſes the perpendicular, on which is marked a ſcale of ſines to the radius of the globe for which it is made; up or down this perpendicular moves a ſlider, through which paſſes a ſmall beam, whoſe extremity next the globe is cut in ſuch a manner as to form a point at the lower edge, which point may be made to touch the globe at pleaſure; and the lower edge ſhews the ſine of the altitude on the perpendicular: a ſmall ſcrew at the back

of

of the ſlider ſerves to fix it at any required diſtance from the baſe. It appeared that this contrivance was new, and ingenious, and ſolves many problems more readily than the quadrant of altitude; but the ſolution depending on a line of ſines, could not be ſo accurate, as by an inſtrument made by Mr. Wright, Mathematical-Inſtrument Maker, in Leadenhall-Street, who, having been preſent at the Committee when the Perpendicular was examined, produced to the Society a Quadrant of a Circle, to ſtand and be moveable on the wooden horizon, and marked with degrees and minutes, the idea of which Mr. Wright allowed to have ariſen in his mind from having ſeen Mr. Maling's contrivance. One of Mr. Wright's improved inſtruments was alſo preſented to Mr. Maling.

A pair of Stirrups, for which a patent had been granted to Mr. Hayward, of Kelvedon Hall, Eſſex, were preſented to the

the Society by him, and reſerved in the Repoſitory.

The Thanks of the Society were given to Mr. Thomas Dornforth, for preſenting to them a ſmall model of what he terms a Wind-Waggon, ſimilar in moſt reſpects to one deſcribed by Biſhop Wilkins, in his Mathematical Magick, page 160.

Ten Guineas were voted to Mr. John Hayward, of Gooch-ſtreet, as an encouragement to his proſecuting his work of carving iron, which appeared ingenious and ornamental, and of which a guard iron for preſerving the backs of coaches from injury, is reſerved in the Society's Repoſitory.

The Thanks of the Society were given to Nathaniel Jarman, Eſq. for having laid before them the Gun Harpoon, with which the whale was ſtruck by Sinclear Halcrow,

Halcrow, to whom the premium was this year adjudged; ſee page 153. This Harpoon was much bent by the blow, and in part broken.

The Thanks of the Society were given to Sir Joſeph Senhouſe, for having ſubmitted to their conſideration a Model of a Machine to be worked by wind for boring Cannon.

The Thanks of the Society were given to Mr. Hunter, of Portland Road, for producing a model, ſhewing a method of preventing any inconvenience from doors paſſing over carpets. The model repreſented a door, having at the bottom a mortice, in which a piece of wood riſes by a ſpring when the door opens, and is preſſed down when the door ſhuts, by a ſmall tongue forcing againſt the inſide of the frame of the door.

The

The Silver Medal and Twenty Guineas were voted to Mr. Furſt, in conſideration of the utility of a contrivance produced by him, and of which trial was made, for increaſing the effect of Engines for extinguiſhing fires. A complete model remains in the Repoſitory of the Society, of which the following is a ſhort deſcription:—From a platform riſes an upright pole or maſt, of ſuch height as may be judged neceſſary; up this pole or maſt ſlides a gaft; and along the upright pole and gaft the leather hoſe from the Engine is conveyed: at the extremity of the gaft the branch of the Engine projects; towards this extremity is fixed an iron frame, whence hang two chains, and from them ropes ſerving to give a horizontal direction to the branch, whilſt other ropes, running through proper pullies, and being thus conveyed down the maſt, ſerve alſo to communicate a vertical motion to it; by theſe means the branch or noſe-pipe of the Engine is conveyed

veyed into the window of any room where the fire more immediately rages, and the effect of the water diſcharged therefrom applied in the moſt efficacious manner to the extinguiſhing it.

REWARDS

# REWARDS

ADJUDGED BY THE

# SOCIETY,

IN M,DCC,LXXXIV.

# REWARDS

BESTOWED IN

# AGRICULTURE.

TO the Earl of UPPER OSSORY, for his extenſive plantations near Ampthill, Bedfordſhire, the GOLD MEDAL. See page 4.

Claſs 87. To Mr. ROBERT DAVIS, jun. of Minehead, Somerſetſhire, for cultivating Rhubarb, the SILVER MEDAL.

Claſs 68. To Mr. WILLIAM GREENHILL, of Eaſt Ham, Eſſex, for cultivating eighty-one acres of Potatoes for the table, the GOLD MEDAL.

To GEORGE ROSS, Eſq. for his extenſive plantations of timber-trees in Scotland, the GOLD MEDAL. See page 13.

## POLITE AND LIBERAL ARTS.

Claſs 127. HONORARY PREMIUM to Lady KATHERINE POWLETT, for a Drawing; the GOLD MEDAL. Subject, A LAUGHING GIRL.

Claſs 130. HONORARY PREMIUM to Mr. JOHN POLLARD, Gould-ſquare, for a Drawing; the SILVER MEDAL. Subject, PORTRAIT OF MRS. SIDDONS.

Claſs 131. HONORARY PREMIUM to MISS SMITH, Great George-ſtreet, Weſtminſter; the GOLD MEDAL. Subject, PORTRAIT OF A GENTLEMAN.

Claſs 132. HONORARY PREMIUM to MISS CATHERINE BLACKWOOD, Somerſet-ſtreet, Portman-ſquare; the SILVER MEDAL. Subject, ST. JOHN.

The foregoing premiums were given in conſequence of the Society's advertiſements publiſhed in 1783;

1783; the following in conſequence of thoſe publiſhed in 1784.

Claſs 119. To Mr. GEORGE SAMUEL, Foſter-Lane, the SILVER MEDALLION, given in conformity to the will of JOHN STOCK, Eſq. Subject, FRONT OF THE SOCIETY'S HOUSE IN THE ADELPHI.

Claſs 120. To Mr. THOMAS LANGDON, Vere-ſtreet, the GREATER SILVER PALLET, for Drawings of Outlines. Subject, the LAOCOON.

Claſs 121. To Mr. EDWARD DAVIES, at Mr. Dickenſon's, New Bond-ſtreet, the LESSER SILVER PALLET, for drawing of Outlines. Subject, THE BOXERS.

Claſs 124. To Mr. WILLIAM PALMER, Mercer-ſtreet, Long-Acre, the GREATER SILVER PALLET, for Drawings of Machines. Subject, Mr. LLOYD'S CIDER-

MILL. This premium was adjudged to Mr. George Samuel; but he having obtained the premium, claſs 119, could not this year receive another.

Claſs 125. To MISS CATHARINE CHARLOTTE RAPER, Chelſea, the LESSER SILVER PALLET, for Drawings of Beaſts. Subject, LIONS FROM THE LIFE.

Claſs 129. To Mr. CHAR. AUGUSTUS EDWARDS, Morden, Surry, the GREATER SILVER PALLET. Subject, DRAWING OF FLOWERS.

Claſs 130. To Mr. JOHN WILLIAM LEWEN, Fenchurch-ſtreet, the LESSER SILVER PALLET. Subject, DRAWING OF FRUIT.

To Mr. WILLIAM BIRCH, James-ſtreet, Covent-Garden, for painting in Enamel, and producing a new Colour for the uſe of Enamel-painters, a ſpecimen of which is reſerved

in

in the Repoſitory for the inſpection of the curious, the GREATER SILVER PALLET.

## MECHANICKS.

TO Mr. GEORGE MALING, Scarborough, for his invention of an inſtrument to ſerve more advantageouſly the purpoſe of the Quadrant of Altitude, the SILVER MEDAL. See page 184.

Claſs 167. To Mr. John BRAITHWAITE, the GOLD MEDAL, for an improved Crane for Wharfs. See page 158.

Claſs 160. To Mr. SINCLEAR HALCROW, Two GUINEAS, for ſtriking a whale with the gun harpoon. See page 154.

To Mr. TIMOTHY MARSHALL, Bury-ſtreet, St. James's, for his invention of a ſecret Eſcutcheon. See page 160.

To Mr. JOHN HAYWARD, Gooch-ſtreet, for his ingenuity in carving iron, exemplified in a Guard for Coaches, reſerved in the Society's Repoſitory, TEN GUINEAS.

To Mr. ——— TAYLOR, of Petworth, Suſſex, for an improvement in latch locks, ſee page 165, the SILVER MEDAL.

To Mr. SOLOMON FURST, the SILVER MEDAL and TWENTY GUINEAS, for his contrivance to increaſe the effect of Engines for extinguiſhing Fires, a model of which is reſerved in the Society's Repoſitory for the uſe of the Publick.

PRESENTS

# PRESENTS

RECEIVED BY THE

# SOCIETY,

In the YEAR M,DCC,LXXXIV.

With the Names of the DONORS.

---

Monſ. le DUC de CHAULNES, F. R. S.

MÉMOIRE ſur la Manière de peindre des Chinois.

Mémoire ſur la véritable Entrée du Monument Egyptien.

Nouvelle Méthode pour ſaturer l'Eau d'Air fixe.

Lettre de M. le Duc de Chaulnes à M. l'Abbé de Saint-Non, & la Réponſe.

MONS. DE MARCORELLE, BARON D'ESCALE.

Hints for neutralizing neceſſary houſes at a ſmall expence, in French and Engliſh, preſented by Thomas Mortimer, Eſq.

JOHN HOWARD ESQ. F. R. S.

The State of the Priſons in England and Wales, with an Account of ſome foreign Priſons and Hoſpitals, third edition.

MR. HENRY EMLYN.

A Propoſition for a new Order of Architecture, with rules for drawing the ſeveral parts. Second edition, folio.

THE SOCIETY FOR INTRODUCING USEFUL KNOWLEDGE INTO MAIDSTONE AND ITS ENVIRONS.

A pamphlet entitled, Relief from Accidental Death, &c.

MONS.

MONS. L'ABBÉ ROZIER.

Two volumes, entitled, Obſervations ſur la Phyſique, for 1782, with a ſupplement. Two vols. ditto for 1783. One volume for the firſt ſix months of the year 1784.

ARTHUR YOUNG, ESQ.

Annals of Agriculture, and other uſeful Arts, firſt volume.

## PRINTS.

MONS. LE DUC DE CHAULNES.

Of an Apparatus for making experiments on Natural Electricity without any danger.

MR. RICHARD SAMUEL.

A View of Ramſgate Pier from the Cliff.

A View of the Bathing-place at Ramſgate.

MISCEL-

## MISCELLANEOUS ARTICLES.

MR. THOMAS REEVES.

A ſmall box Britiſh Ink, made to imitate Indian Ink.

MR. WILLIAM REEVES.

A ſmall box Britiſh Ink, make to imitate Indian Ink.

MR. GEORGE COWEN, DUBLIN.

A ſmall box of Water-colours in cakes.

A CAT-

# A CATALOGUE

OF THE

# MODELS AND MACHINES

Received ſince the publication of the Second Volume of the Society's Tranſactions; with the numbers as they are arranged in the claſs to which they belong.

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## CLASS IV.

XCI. A NEW-conſtructed Latch Lock, by Mr. Taylor, of Petworth, for which he had the Silver Medal, 1784.

XCII. A carved iron Guard for the back part of a Coach, by Mr. John Hayward, for which he had a bounty of Ten Guineas, 1784.

A Model

XCIII. A Model of a Wind-Waggon, presented by Mr. Thomas Dornforth, 1784.

XCIV. A Model of a Crane, presented by Mr. Bunce, for which he had the Silver Medal, 1784.

XCV. A Model of a Machine for increasing the effect of Engines for extinguishing fires, by Mr. Solomon Furst, for which he had the Silver Medal and Twenty Guineas, 1784.

A LIST

# A LIST

OF THE

# OFFICERS OF THE SOCIETY,

And CHAIRMEN

OF THE SEVERAL

# COMMITTEES.

---

PRESIDENT.

ROBERT Lord Romney, .LL. D. F. R. S.

VICE-PRESIDENTS.

Charles Duke of Richmond, &c. F. R. S.
Hugh Duke of Northumberland, F. R. S.
Jacob P. Earl of Radnor
Hugh Earl Percy
Hon. Charles Marſham, F. R. S.

Sir

Sir George Auguſtus Eliott, K. B.
Edward Hooper, Eſq. F. R. S.
Owen Saluſbury Brereton, Eſq. F. R. S. and A. S.
Sir Herbert Mackworth, Bart. F. R. S.
James Daviſon, Eſq.
Sir William Dolben, Bart.
Sir Watkin Lewes, Knight.

SECRETARY.

Mr. Samuel More.

ASSISTANT-SECRETARY.

Mr. Richard Samuel.

REGISTER.

Mr. George Cockings.

CHAIRMEN

# CHAIRMEN OF THE SEVERAL COMMITTEES,

Elected November 3, 1784.

---

ACCOMPTS.

MR. Hebert.
Mr. Wingfield.

CORRESPONDENCE AND PAPERS.

Mr. Chavany.
Mr. Pourcin.

POLITE ARTS.

Mathew Duane, Eſq.
Valentine Green, Eſq.

AGRICULTURE.

Nathaniel Jarman, Eſq.
John Pratt, Eſq.

MANUFACTURES.

Mr. Charles Smith.
Mr. Baynes.

MECHA

MECHANICKS.

Joſeph Hurlock, Eſq.
Samuel Ewer, Eſq.

CHEMISTRY, &c.

Mr. Gibbs.
Mr. Kendrick.

COLONIES AND TRADE.

Caleb Whitefoord, Eſq.
Mr. Lindſell.

MISCELLANEOUS MATTERS.

Mr. Hebert.
Mr. Jacob.

A LIST

# A LIST

## OF

# CONTRIBUTING MEMBERS,

## ELECTED SINCE THE PUBLICATION OF THE SECOND VOLUME OF THE SOCIETY'S TRANSACTIONS.

N. B. Thoſe marked with a * pay Three Guineas annually; and thoſe with P are Perpetual Members.

---

### A

ABDY, Reverend Mr. *Cooper's Sale, Eſſex.*

Affleck, Admiral Sir Edmund, Bart. *Hollis-ſtreet, Cavendiſh-Square.*

Affleck, Captain William, *Hollis-ſtreet, Cavendiſh-ſquare.*

Affleck, Captain Philip, *Wimpole-ſtreet.*

Allen, William, Eſq. *Southampton-Row.*

Armſtrong, Mr. Moſtyn John, *Norwich.*

B

Baldwin, Richard, Eſq. *Weſt Smithfield.*

Bacon, John, Eſq. *Firſt-Fruits Office, Temple.*

* Beaufoy, Henry, Eſq. *Great George-ſtreet, Weſtminſter.*

Braithwaite, Daniel, Eſq. *Poſt-Office.*

Brown, Mr. Joſeph, *George-Yard, Lombard-ſtreet.*

Bucknall, Thomas Skipp, Eſq. *Conduit-ſtreet.*

Bulcock, Mr. William, Surgeon, *John-ſtreet, Adelphi.*

Byfield, Mr. George, Architect, *Manchester Buildings.*

C

Cardiff, Right Hon. Lord

Compton, Right Hon. Lord

Campbell, Major General Archibald, *Governor of Jamaica.*

Collins, Thomas, Eſq. *Berner's-ſtreet.*

Crowder, William Henry, Eſq. *Middle Temple.*

Darch,

D

Darch, Major Thomas, *Suffolk-ſtreet, Cavendiſh-Square.*

De Berdt, Dennis, Eſq. Merchant, *New Broad-ſtreet.*

Douglas, Captain Peter, *Robert-ſtreet, Adelphi.*

Duval, Mr. John Peter, *Hackney.*

E

Evans, Mr. John, *Ely Place.*

Evans, Morgan, Eſq. *Lincoln's Inn.*

F

Ferrers, Earl.

Frankland, William, Eſq. *Gray's Inn.*

Frankland, Roger, Eſq. *Chriſt-Church College, Oxford.*

Franks, William, Eſq. *Percy-ſtreet, Rathbone-place.*

Freeman, Stephen, M. D. *Strand.*

G

Gauſſen, Samuel, Eſq. *Bedford-Square.*

Gordon, James, jun. Eſq. *Moor-place, Herts.*

Gregory, Mr. Henry, Mathematical Inſtrument Maker, *Leadenhall-ſtreet.*

H

Hawke, Lord.

Hartley, Mr. Thomas, Wholeſale Glover, *Fiſh-ſtreet Hill.*

Heaviſide, Richard, Eſq. *Peterborough-Houſe, Fulham.*

Henderſon, Chriſtopher, Eſq. *Robert-ſtreet, Adelphi.*

Hodges, William, Eſq. *Queen-ſtreet, May-Fair.*

Huſſey, John. Eſq. *Chelſea Hoſpital.*

I

Jackſon, Henry, M. D. *Hanover-ſtreet, Hanover-Square.*

P Jebb, Sir Richard, Bart. *Great George-ſtreet, Weſtminſter.*

Jones, Sir William, Bart. *Cavendiſh-Square.*

Kennett,

K

Kennett, Mr. Benjamin, jun. *Eſſex-ſtreet, Strand.*

Keyſall, John, Eſq. *Queen-ſquare, Holborn.*

L

Leiceſter, Earl of.

* Landaff, Richard, Lord Biſhop of.

Lewis, Percival, Eſq. *Lincoln's Inn.*

* Loveden, Edward Loveden, Eſq. *Conduit-ſtreet.*

Lunardi, Vincent, Eſq. *Poland-ſtreet.*

M

Macknamara, John, Eſq. *Portman-ſquare.*

Miers, Mr. John, Merchant, *Canon-ſtreet.*

Montolieu, Lewis, Eſq. *Lower Groſvenor-ſtreet.*

N

Newburgh, Earl of.

Nicholas, Robert, Eſq. *Aſhton Krynes, Wiltſhire.*

O

Oldham, Mr. James, Ironmonger, *Brook-ſtreet, Holborn.*

P

Parker, Mr. Samuel, *Earl-ſtreet, Black-Friars.*

Pariſh, ——, Eſq. *Tower of London.*

Parry, William, Eſq. *Norton Hall, Wilts.*

Pourcin, Mr. Joſeph, *Taviſtock-ſtreet.*

Proby, Charles, jun. Eſq. *Inner Temple.*

R

Rawlinſon, Abraham, Eſq. *Lancaſter.*

Reeves, Mr. William, Colourman, *Strand.*

S

Saye and Sele, Lord.

Scales, Mr. Bernard, Surveyor, *Great Wharley, Eſſex.*

Smith, Joſhua, Eſq. *Great George-ſtreet, Weſtminſter.*

Spackman,

Spackman, Mr. James, Merchant, *Jewry-ſtreet, Aldgate.*

Spencer, Henry, Eſq. *Dulwich.*

Stephens, Francis, Eſq. *Sheerneſs.*

Steventon, Anthony, Eſq. *Ely Place, Holborn.*

T

Thomas, David, Eſq. *Pay Office, Horſe-Guards.*

Trotter, Mr. John, *Taviſtock-ſtreet, Bedford-ſquare.*

V

Vere, Mr. Samuel, Tallowchandler to his Majeſty, *Clare-ſtreet, Clare-market.*

W

Walter, Mr. John, Printer, *Black-Friars.*

White, Mr. William Wood, Wholeſale Hoſier, *Leadenhall-ſtreet.*

Williams, Thomas, Eſq. *Llanidan, Angleſea.*

Williams, Mr. Owen, *at* No. 12, *Aldermanbury.*

Wilſon, Mr. Walter, Cabinet-maker, *Strand.*

Wright, Mr. Gabriel, Mathematical Inſtrument Maker, *Leadenhall-ſtreet.*

---

MEMBER omitted in the Firſt Volume.

William Pococke, Eſq. *Devonſhire-ſtreet, Red-Lion Square.*

A LIST

# A LIST

OF THE

# CORRESPONDING MEMBERS,

Elected ſince the publication of the Second Volume of the Society's Tranſactions.

---

BERTIER, Monſ. *Intendant Général de Paris.*

Billardiere, Monſ. De la, M. D. *Paris.*

Bombelles, Le Marquis De, *Bregadier des Armées du Roi de France, Commandeur de l'Ordre de St. Lazare, & Miniſtre du Roi auprès de la Diète Générale de l'Empire.*

Magnin, Mr. Simeon, *Méchaniſte à Commugnij, dans le Pays de Vaud en Suiſſe.*

Marcorelle, Monſ. Baron D'Eſcale, *of Narbonne.*

Pelham, Henry, Eſq. *Balligreen, Six-Mile-Bridge, County Clare, Ireland.*

# PREMIUMS

OFFERED BY THE

# SOCIETY

FOR THE ENCOURAGEMENT OF

# ARTS, MANUFACTURES,

AND

# COMMERCE,

IN THE

YEAR M.DCC.LXXXV.

TO THE

# PUBLICK.

ADELPHI-BUILDINGS, *April* 11, 1785.

THE chief objects of the attention of the Society for the Encouragement of Arts, Manufactures, and Commerce, in the application of their Rewards, are, Ingenuity in the ſeveral branches of the Polite and Liberal Arts; uſeful diſcoveries and improvements in AGRICULTURE, MANUFACTURES, MECHANICKS, and CHEMISTRY, or the laying open any ſuch to the Publick; and, in general, all ſuch uſeful inventions, diſcoveries, or improvements, (though not mentioned in the Book of Premiums) as may appear to have a tendency to the advantage of Trade and Commerce. The Society therefore, in purſuance of their plan, propoſe to beſtow the following premiums.

*Premiums*

*Premiums for Planting and Huſbandry.*

1. ACORNS. For ſetting or ſowing the greateſt quantity of land, not leſs than ten acres, with Acorns, between the firſt day of October, 1784, and the firſt of January, 1785; and for fencing and preſerving the ſame effectually, in order to raiſe timber; the gold medal.

2. For the ſecond greateſt quantity of land, not leſs than five acres, ſet or ſown with acorns, agreeably to the above conditions, the ſilver medal.

CERTIFICATES of the ſetting or ſowing agreeably to the above conditions, and that there are not fewer than one thouſand plants on each acre, to be produced to the Society, on or before the firſt Tueſday in November, 1785.

3, 4. The ſame premiums are extended one year further; certificates to be produced on

on or before the firſt Tueſday in November, 1786.

5. RAISING OAKS. To the perſon who ſhall raiſe the greateſt number of Oaks, not fewer than five thouſand, either from young plants, or from acorns, in woods, parks, or foreſts, that have long been under timber, and effectually fence and preſerve the ſame, in order to ſecure a ſucceſſion of oak timber in this kingdom, the gold medal.

9. For the next greateſt quantity, not fewer than three thouſand, the ſilver medal.

CERTIFICATES and accounts to be produced on or before the firſt Tueſday in January, 1788.

7, 8. The ſame premiums are extended one year further.

CER-

CERTIFICATES to be produced on or before the firſt Tueſday in January, 1789.

9. CHESNUTS. For ſetting or ſowing the greateſt quantity of land, not leſs than ſix acres, with Spaniſh Cheſnuts, before the firſt day of May, 1785; and for effectually fencing and preſerving the ſame, in order to raiſe timber; the gold medal.

10. For the ſecond greateſt quantity, not leſs than four acres, the ſilver medal.

11. For the third greateſt quantity, not leſs than two acres, the ſilver medal.

CERTIFICATES of ſetting or ſowing agreeably to the above conditions (and that there are twelve hundred Spaniſh Cheſnut plants, at leaſt, on each acre), muſt be delivered to the Society on or before the firſt Tueſday in November, 1785.

12, 13,

12, 13, 14. The like premiums will be given for ſetting or ſowing Spaniſh Cheſnuts before the firſt of May, 1786.

CERTIFICATES to be delivered on or before the firſt Tueſday in November, 1786.

15. ELM. For planting the greateſt number of the Engliſh Elm, not leſs than eight thouſand, between the twenty-fourth of June, 1784, and the twenty-fourth of June, 1785; and for the effectually fencing and preſerving the ſame, in order to raiſe timber; the gold medal.

16. For the ſecond greateſt number, not leſs than five thouſand, the ſilver medal.

17. For the third greateſt number, not leſs than four thouſand, the ſilver medal.

CERTIFICATES of having planted agreeably to the above conditions, and ſpecifying the diſtance of the trees, muſt be delivered to the Society, on or before the firſt Tueſday in November, 1785.

18, 19, 20. The ſame premiums are extended one year further.

CERTIFICATES to be delivered on or before the firſt Tueſday in November, 1786.

21. LARCH. For planting out, from the twenty-fourth of June, 1784, to the twenty-fourth of June, 1785, at a diſtance not more than five feet, the greateſt number of Larch-trees, not leſs than five thouſand; the plants to be between two and four years old when planted out; and for effectually fencing and preſerving the ſame, in order to raiſe timber; the gold medal.

22. For

22. For the ſecond greateſt number, not leſs than three thouſand, the ſilver medal.

CERTIFICATES of planting according to the above conditions, to be delivered on or before the laſt Tueſday in November, 1785.

23, 24. The like premiums will be given, on the ſame conditions, for planting out Larch-trees, between the twenty-fourth of June, 1785, and the twenty-fourth of June, 1786.

CERTIFICATES to be produced on or before the laſt Tueſday in November, 1786.

25. HUNTINGDON WILLOW. For the greateſt number of acres, not leſs than three, planted in the year 1785, with Huntingdon Willows; the number of cuttings to be at leaſt one thouſand on each acre,

properly fenced and ſecured; the gold medal.

CERTIFICATES to be produced on or before the laſt Tueſday in December, 1785.

26. The ſame premium is extended one year further.

CERTIFICATES to be produced to the Society on or before the laſt Tueſday in December, 1786.

27. ALDER. For the greateſt number of acres, not leſs than ſix, planted in the year 1784, with Alders, to be at leaſt one thouſand on each acre, properly fenced and ſecured; the gold medal.

CERTIFICATES to be produced to the Society, on or before the laſt Tueſday in December, 1785, of the ſaid planting, and

and that the trees were then growing on the land.

28. The ſame premium is extended one year further.

CERTIFICATES to be produced on or before the laſt Tueſday in December, 1786.

29. UPLAND OR RED WILLOW. For the greateſt number of acres, not leſs than three, planted before the end of April, 1785, with Upland or Red Willow, properly fenced and ſecured, the number of plants on each acre to be at leaſt twelve hundred; the gold medal.

CERTIFICATES to be produced on or before the laſt Tueſday in April, 1786.

It is well known that this ſpecies of Willow thrives well on dry ſandy land.

30. The ſame premium is extended one year further.

CERTIFICATES to be produced on or before the laſt Tueſday in April, 1787.

31. ASH. For planting the greateſt number of acres, not leſs than ſix, in the year 1785, with Aſh for timber; the plants to be at leaſt two years old, properly ſecured and fenced; the number of plants on each acre to be at leaſt twelve hundred; the gold medal.

32. For the next greateſt number of acres, not leſs than four, the ſilver medal.

CERTIFICATES to be delivered on or before the ſecond Tueſday in March, 1786.

33, 34. The ſame premiums are extended one year further.

CER-

CERTIFICATES to be delivered on or before the ſecond Tueſday in December, 1787.

35. LOMBARDY, OR PO POPLAR. For planting, in the year 1784, the greateſt number of the Lombardy Poplar, or Po Poplar, properly fenced and ſecured, for raiſing timber; the gold medal.

CERTIFICATES to be produced on or before the ſecond Tueſday in November, 1785.

The quantity of land to be not leſs than ſix acres, and not fewer than twelve hundred plants on each acre.

N. B. This tree is called by ſome the Pine Poplar.

36. MIXED TIMBER TREES. To the perſon who ſhall encloſe, and plant or ſow the greateſt number of acres, not

leſs than ten, with the beſt ſorts of Foreſt Trees, for timber, between the firſt of October, 1784, and the firſt of May, 1786; and ſhall deliver to the Society an account of the methods uſed in making the plantations, together with proper Certificates that the trees are then in a thriving condition on the land; the gold medal.

The Accounts and Certificates to be produced to the Society on or before the firſt Tueſday in November, 1788.

37. The ſame premium is extended one year further.

Accounts and Certificates to be produced on or before the firſt Tueſday in November, 1789.

38. MULBERRY CUTTINGS. For raiſing the greateſt number of White or Black Mulberry Trees, for feeding Silkworms, not leſs than three hundred, from

from cuttings in the year 1785, the gold medal.

CERTIFICATES of the raiſing and growth, with the manner of culture, and that the plants were growing in September, 1788, to be produced on or before the firſt Tueſday in November, 1788.

39. MULBERRY CUTTINGS. To the perſon who ſhall form, in the year 1785, the largeſt plantation, not leſs than one acre of Mulberry Cuttings, for the purpoſe of feeding Silkworms, the gold medal.

CERTIFICATES of the quantity of land, and the method of culture, that the Mulberry Plants are not more than three feet aſunder, and that they were growing in the month of September, 1788, to be produced on or before the firſt Tueſday in December, 1788.

It

It is propoſed that this plantation be continually kept in a low ſtate, to the intent that the gathering the leaves may always be within the reach of women and children.

*** *The Candidates for planting all kinds of trees, are to certify, that the reſpective plantations are properly fenced and ſecured, and particularly to ſtate the condition the plants were in at the time of ſigning ſuch Certificates.*

*Any information which the Candidates for the foregoing premiums may chuſe to communicate, relative to the methods made uſe of in forming the plantations, or promoting the growth of the ſeveral trees, or any other obſervations that may have occurred on the ſubject, will be thankfully received.*

40. TREES FOR USE WHEN EXPOSED TO THE WEATHER. To the perſon who ſhall ſend the moſt ſatisfactory

tisfactory account, verified by experiments, to determine which of the following trees is of the greateſt utility for timber or poles, for uſe when expoſed to the weather, viz.

| | |
|---|---|
| Larch, | Black-Poplar, |
| Aſh, | Spaniſh-Cheſnut, |
| Willow, | Alder, |
| Lombardy-Poplar, | |

The gold medal.

The Accounts to be produced on or before the ſecond Tueſday in December, 1785.

41. The ſame premium is extended one year further.

The Accounts to be produced on or before the ſecond Tueſday in December, 1786.

42. PRESERVING ACORNS. To the perſon who ſhall produce to the Society

ciety the moſt effectual method of preventing Acorns, when ſown or planted for timber, being injured by Mice; the gold medal.

The Accounts, verified by actual experiments, with proper Certificates that the methods made uſe of have been fully ſufficient for the purpoſe, to be produced on or before the laſt Tueſday in November, 1785.

43. PRESERVING CHESNUTS, and SEEDS of other FOREST TREES. To the perſon who ſhall produce to the Society, the moſt effectual method of preventing Cheſnuts, and the Seeds of other Foreſt-trees, when ſown or planted for Timber, being deſtroyed by Mice, the ſilver medal.

The Accounts, verified by actual experiments, with proper Certificates that the methods made uſe of have been fully ſufficient

ficient for the purpoſe, to be produced on or before the laſt Tueſday in November, 1785.

44, 45, 46. The premiums for preſerving Acorns, Cheſnuts, and other Seeds, are extended one year further; the Accounts to be produced on or before the laſt Tueſday in November, 1786.

47. PLANTING BOGGY OR MORASSY SOILS. For an account of the beſt ſet of experiments, ſent by the planter, or his repreſentative, to aſcertain the comparative advantages of planting boggy or moraſſy ſoils, with White Poplar, Black Poplar, Lombardy Poplar, and Willow; the gold medal.

It is required that not leſs than half an acre be planted with each, and the plants to be not more than four feet aſunder.

It is alſo required that the plantation ſtand fourteen years; at the end of which,

to

to be all cut down and meaſured, or accurately meaſured ſtanding. The Certificates of the meaſure and value, and that the whole is properly fenced and ſecured, to be produced on or before the firſt Tueſday in January, 1792.

N. B. Any information relating to the ſtate of the Plantation, if ſent to the Society, between the time of planting and claiming the premium, will be thankfully received.

48. The ſame premium is extended one year further.

CERTIFICATES to be produced on or before the firſt Tueſday in January, 1793.

49. The ſame premium is extended one year further.

CERTIFICATES to be produced on or before the firſt Tueſday in January, 1794.

50. The

50. The ſame premium is extended to the year 1796.

CERTIFICATES to be produced on or before the firſt Tueſday in January, 1797.

51. ROOTS OF CORN. To the perſon who ſhall aſcertain from obſervation, and by experiment, the ſucceſſion of the different Roots of Corn (diſtinguiſhing the times when ſuch ſucceſſion of roots takes place), particularly thoſe which ſhoot out at or near the time the plants go into ear; ſhewing alſo from facts, the injury ariſing from the failure of thoſe particular roots, and the moſt effectual means of preventing ſuch misfortune; the gold medal.

To be produced on or before the firſt Tueſday in January, 1786.

52. The ſame premium is extended one year further. Accounts to be delivered on or before the firſt Tueſday in January, 1787.

N. B. Theſe

N. B. Theſe premiums are extended to Scotland and Ireland.

53. COMPARATIVE CULTURE OF WHEAT. For the beſt ſet of experiments to aſcertain whether it is moſt advantageous to cultivate Wheat, by ſowing it in the common broad-caſt way, by drilling it in equidiſtant rows, or by dibbling, hoeing the intervals; the gold medal.

It is deſired that the diſtance between the rows, may not exceed eleven inches, and that an account of the nature and condition of the land on which the experiments are made, together with an account of the produce of the Corn, be produced to the Society, on or before the firſt Tueſday in February, 1786.

54. The ſame premium is extended one year further.

The

The Accounts to be produced to the Society, on or before the firſt Tueſday in February, 1787.

53. BEANS AND WHEAT. To the perſon who ſhall plant or drill, between the firſt of December, 1785, and the firſt of March, 1786, the greateſt quantity of land, not leſs than ten acres, with Beans, and ſhall ſow the ſame land with Wheat in the ſame year, 1786; ten guineas.

It is required that an Account of the ſort and quantity of Beans, the time of planting or drilling, and of reaping or mowing them, the produce per acre threſhed, the application of the ſtraw, the expence of planting or drilling, hand or horſe hoeing, the diſtance of rows, and the quality of the ſoil, together with Certificates of the number of acres, and that the land was actually ſown with Wheat in the year 1786, to be produced on or before the firſt Tueſday in November, 1787.

N. B. The Society have been informed that Beans may be drilled or planted ſo early as the month of December, from whence may be derived the advantage of an early harveſt; in which caſe, the ſtraw will be far more valuable than that from a latter planting or drilling.

54. TURNEPS. For the beſt account of experiments made on at leaſt ſix acres of land, to determine the comparative advantages of the drill or broad-caſt method in the cultivation of Turneps; the gold medal.

The Accounts to be delivered in, on or before the third Tueſday in April, 1786.

55. TURNEPS. For the beſt account of experiments made on at leaſt ſix acres of land, to determine the comparative advantages of the drill or broad-caſt method

method in the cultivation of Turneps; ten guineas.

The Accounts to be delivered in, on or before the third Tueſday in April, 1787.

56. GREEN VEGETABLE FOOD. For the beſt account, confirmed by experiments, of the Vegetable Food (Cabbages and Turneps excepted) growing in the months of March and April, that will moſt increaſe the milk in mares, cows, and ewes, at that ſeaſon; provided ſuch food can be cultivated at an expence that will admit of its being applied to the above purpoſes; the gold medal.

CERTIFICATES to be produced on or before the ſecond Tueſday in November, 1785.

57. The ſame premium is extended one year further.

CERTIFICATES to be produced on or before the ſecond Tueſday in November, 1786.

58. TURNEP-ROOTED CABBAGE. For raiſing, and having duly cultivated Turnep-rooted Cabbage, in the year 1783, for the feeding cattle or ſheep, on the greateſt number of acres, not leſs than ten; and giving an account of the ſoil, culture, time, and manner of feeding off, produce, and the effects on cattle or ſheep, fed with it; the gold medal.

59. For the next greateſt number of acres, not leſs than five, the ſilver medal.

CERTIFICATES of the quantity of land, with the accounts, to be produced on or before the laſt Tueſday in October, 1785.

60. The

60. The ſame premiums are extended one year further.

CERTIFICATES to be produced on or before the laſt Tueſday in October, 1786.

61. TURNEP-ROOTED CABBAGE. For raiſing, and having duly cultivated Turnep-rooted Cabbage, in the year 1785, for the feeding cattle or ſheep on the greateſt number of acres, not leſs than ten; and giving an account of the ſoil, culture, time, and manner of feeding off, produce, and the effects on cattle or ſheep fed with it; ten guineas.

62. For the next greateſt number of acres, not leſs than five, five guineas.

CERTIFICATES of the quantity of land, with the accounts, to be produced on or before the laſt Tueſday in October, 1787.

63. TURNEP-ROOTED CABBAGE. To the perſon who ſhall have raiſed in the year 1784, the greateſt quantity, per acre, of Turnep-rooted Cabbage, on not leſs than four acres; the gold medal.

CERTIFICATES of the number of acres, and produce by weight, free from leaves and dirt, and before houſing, with an account of the ſoil, preparation and culture, to be produced on or before the firſt Tueſday in November, 1785.

64. CULTIVATING ROOTS AND HERBAGE FOR FEEDING SHEEP AND BLACK CATTLE. For the moſt ſatisfactory experiments made between Michaelmas, 1785, and the firſt of May, 1786, in order to aſcertain which of the following plants can be cultivated and houſed, or otherwiſe ſecured for winter fodder, to the greateſt advantage, viz.

Turnep-

Turnep-rooted Cabbage, Carrots,
Turnep Cabbage, Parſnips,
Turneps, Potatoes;
The gold medal.

The Accounts to be produced on or before the firſt Tueſday in November, 1786.

It is required that the above roots be taken off the land by the laſt day of October, 1785; that a crop of Wheat may be ſown in the ſame ground, and the particulars of the ſowing and planting, taking up, produce, preſervation, and application to the feeding Sheep and Black Cattle, be ſpecified. The comparative experiments muſt be made between two or more of any of the abovementioned plants, and not leſs than two acres be cultivated with each particular kind of plant.

N. B. Great advantage will ariſe to the farmer occupying land in the neighbourhood of extenſive commons, from the

conveniency of keeping large flocks of ſheep, and herds of cattle, if the difficulty of ſupporting them through the winter was obviated by a due knowledge of this practice.

65. The ſame premium is extended one year further.

CERTIFICATES to be produced on or before the firſt Tueſday in November, 1787.

66. MANAGING BEES. To the perſon who ſhall produce to the Society the moſt ſatisfactory account, verified by experiments, of managing Bees to the greateſt advantage in this climate; the gold medal.

To be produced on or before the ſecond Tueſday in January, 1786.

67. CUL-

67. CULTIVATING THE TRUE RHUBARB. For raiſing, before the end of the year 1785, the greateſt number of plants, not leſs than three hundred, of Rheum Palmatum, or True Rhubarb; the gold medal.

68. For the next greateſt quantity, not leſs than two hundred plants, the ſilver medal.

CERTIFICATES of the number of plants, that they ſtand at leaſt ſix feet aſunder, that they have been in a thriving ſtate during the preceding ſummer, with an account of the ſoil, culture, and aſpect, to be produced on or before the ſecond Tueſday in February, 1786.

69, 70. The ſame premiums are extended one year further, the plants to ſtand at leaſt four feet aſunder.

CER-

CERTIFICATES to be produced on or before the ſecond Tueſday in February, 1787.

71. RHUBARB. For the greateſt quantity of Rhubarb of Britiſh growth, not leſs than twenty pounds weight, equal to ſuch as is commonly ſold in the ſhops, under the name of Turkey or Ruſſia Rhubarb; five pounds of which to be produced as a ſample, with certificates that the remainder is of equal goodneſs; and a particular account of the manner of culture, and cure, on or before the firſt Tueſday in November, 1785; the gold medal.

72. For the next greateſt quantity, not leſs than ten pounds weight, the ſilver medal.

73, 74. The ſame premiums are extended one year further. The ſamples and certificates to be produced on or before

fore the firſt Tueſday in November, 1786.

75. ASCERTAINING THE COMPONENT PARTS OF ARABLE LAND. To the perſon who ſhall produce to the Society the moſt ſatisfactory ſet of experiments, to aſcertain the due proportion of the ſeveral component parts of Arable Land, in one or more counties in Great Britain, by an accurate analyſis of it; and who, having made a like analyſis of ſome poor land, ſhall, by comparing the component parts of each, and thereby aſcertaining the deficiencies in the poor ſoil, improve a quantity of it, not leſs than two acres, by the addition of ſuch parts as the former experiments ſhall have diſcovered to be wanting therein, and therefore probably the cauſe of its ſterility; the gold medal.

It is required that the manurings, ploughings, and crops of the improved land,

land, be the ſame after the improvement as before; and that a minute account of the produce in each ſtate, of the weather, and of the various influencing circumſtances, together with the method made uſe of in analyſing the ſoils, be produced, with proper certificates, and the chymical reſults of the analyſes, which are to remain the property of the Society, on or before the laſt Tueſday in November, 1788.

It is expected that a quantity, not leſs than ſix pounds, of the rich, of the poor, and of the improved ſoils, be produced with the certificates.

N. B. Among the methods or proceſſes made uſe of by Chymiſts, and called *dry* or *moiſt*, the latter only appears adapted to the aſcertaining the reſpective proportions of the component parts of Arable Earth.—Dr. Shaw, in his Chymical Lectures; Dr. Home, in his Principles of

of Agriculture; Dr. George Fordyce, in his Elements of Agriculture; and Sir Torbern Bergman, in his *Diſſertation ſur les Terres géoponiques*, have treated of theſe ſubjects.

76. The ſame premium is extended one year further; the accounts to be produced on or before the laſt Tueſday in November, 1789.

77. The ſame premium is extended one year further; the accounts to be produced on or before the laſt Tueſday in November, 1790.

78. The ſame premium is extended one year further; the accounts to be produced on or before the laſt Tueſday in November, 1791.

79. IMPROVING LAND LYING WASTE. For the beſt account of a method of improving any of the following

lowing ſoils, being land lying waſte or uncultivated, viz. Clay, Gravel, Sand, Chalk, Moor, or Peat-earth, and Bog; verified by experiments on not leſs than ten acres of land, to be produced on or before the ſecond Tueſday in December, 1785; the gold medal for each.

80. For the next in merit, the ſilver medal.

The ſoil, manner of improvement, expence, and product, are required to be fully explained.

81, 82. The ſame premiums are extended one year further.

The Accounts to be produced on or before the ſecond Tueſday in December, 1786.

83, 84. The ſame premiums are extended one year further.

The

The Accounts to be produced on or before the ſecond Tueſday in December, 1787.

85. MANURES. To the perſon who ſhall give the moſt ſatisfactory account, verified by accurate experiments, on what ſoil the application of Marle, Chalk, Lime, or Clay, ſeverally, as manures, be moſt beneficial; the gold medal.

It is required that each experiment be made on one acre, and that they be continued four years, the ſame kind of Grain being ſown the ſame year on the ſeveral ſpots.

It is alſo required, that if different manures are compared, the experiments be made on ſimilar ſoils, lying near each other.

An account of the nature of the ſoil, manure, and the quantity laid on, with all

all expences and crops, to be delivered, with ſpecimens of the ſoil and manure, on or before the firſt Tueſday in January, 1786.

86. The ſame premium is extended one year further.

The accounts and ſpecimens to be produced on or before the firſt Tueſday in January, 1787.

87. The ſame premium is extended one year further.

The accounts and ſpecimens to be produced on or before the firſt Tueſday in January 1788.

88. MANURES. For the moſt ſatisfactory ſet of experiments, to aſcertain the comparative advantage of the following manures, uſed as Top-Dreſſings, on Graſs or Corn Land, viz. Soot, Coal-Aſhes,

Aſhes, Wood-Aſhes, Lime, Night-Soil; the gold medal.

It is required that not leſs than half an acre of land be appropriated to each Manure, the ſoils ſimilar, and lying near each other; and if the Manure be uſed on Corn Land, then it is required that the ſame kind of grain be ſown the ſame year on each ſpot; the experiments to be continued not leſs than two years.

An Account of the nature of the Soil, quantity, and expence of the Manure and Crops, with Certificates, to be produced on or before the firſt Tueſday in December, 1787.

89. ASCERTAINING THE BEST COURSE OF CROPS ON CLAY SOIL. To the perſon who ſhall give the moſt ſatisfactory account, verified by comparative experiments, in order to aſcertain the courſe of Crops, which, with

or without a fallow, ſhall, during the ſpace of eight years, prove moſt profitable, and ſhall leave the land in the beſt ſtate, on a Clay Soil; the gold medal, or fifty pounds.

It is required that ſuch comparative experiments be made on three acres at leaſt in each mode; the ſoil to be as contiguous and ſimilar as poſſible. An account of the ſoil, management, and crops, to be delivered on or before the firſt Tueſday in January, 1786.

90. COURSE OF CROPS ON STRONG LAND. For the moſt ſatisfactory account, verified by experiments, made on not leſs than five acres of Clay, or wet Loam, to aſcertain the advantages of the following courſe of crops, viz. Firſt, Beans drilled, or planted and hoed; Secondly, Wheat; the gold medal.

Theſe

Theſe experiments to be continued two courſes, or four years.

CERTIFICATES, with an account of the ſoil, culture, and quantity of manure, if any, laid on, to be produced on or before the laſt Tueſday in March, 1788.

N. B. The ſucceſs of this courſe of crops, much depending on the land being kept entirely clean, it is expected that each crop of the Beans be horſe-hoed or hand-hoed, at leaſt three times.

91. IMPROVING WASTE MOORS. For the improvement of the greateſt number of acres of Waſte Moor Land, not leſs than one hundred; the gold medal.

It is required that the land, before improvement, be abſolutely uncultivated, in a great meaſure uſeleſs, not let to any tenant, and without any building upon it, except cottages or huts; that, in its

improved ſtate, it ſhall be encloſed, cultivated, and divided into fields, with buildings erected thereon, ſufficient for the uſe and reſidence of a tenant.

CERTIFICATES of the number of acres, of the quality of the Moor ſo improved, of the mode and expence of the improvement; the ſtate it is in, as to the proportion of graſs to arable; and the rent at which it is let; to be produced on or before the firſt Tueſday in February, 1786.

92. The ſame premium is extended one year further.

CERTIFICATES to be produced on or before the firſt Tueſday in February, 1787.

93. The ſame premium is extended one year further.

CERTIFICATES to be produced on or before the firſt Tueſday in February, 1788.

94. GAIN-

94. GAINING LAND FROM THE SEA. To the perſon who ſhall produce to the Society an account of the beſt method, verified by actual experiment, of gaining Land from the Sea, not leſs than twenty acres, on the coaſt of England or Wales; the gold medal.

CERTIFICATES of the quantity of Land, and that the experiments were begun after the firſt of January, 1780, to be produced to the Society, on or before the firſt Tueſday in October, 1785.

N. B. The Society have been credibly informed, that Land has been gained on the coaſt of Holland, by fixing rows of whiſps of ſtraw upright in the ſand, at about a foot diſtant from each other, or by fixing ſtakes at proper diſtances from each other, and whattling ſtraw-bands between them.

95. The ſame premium is extended one year further.

CERTIFICATES to be produced on or before the firſt Tueſday in October, 1786.

96. The ſame premium is extended one year further.

CERTIFICATES to be produced on or before the firſt Tueſday in October, 1787.

97. The ſame premium is extended one year further.

CERTIFICATES to be produced on or before the firſt Tueſday in October, 1788.

98. The ſame premium is extended one year further.

CERTIFICATES to be produced on or before the firſt Tueſday in October, 1789.

99. DRILL,

99. DRILL PLOUGH FOR HORSE BEANS. For the beſt Drill Plough for Horſe Beans only; being an improvement on thoſe already in the poſſeſſion of the Society, or generally known; to be produced to the Society, on or before the firſt Tueſday in January, 1786; the ſilver medal, or ten guineas.

It is expected the plough be ſtrong and cheap, no variation of depth or diſtance being required.

The Plough to which the premium is adjudged, is to become the property of the Society.

100. MACHINE TO ANSWER THE PURPOSE OF REAPING OR MOWING CORN. For inventing a Machine to anſwer the purpoſe of mowing or reaping Wheat, Rye, Barley, Oats, or Beans, by which it may be done more expeditiouſly and cheaper, than by any

method now practiſed, provided it does not ſhed the Corn or Pulſe, more than the methods in common practice, and that it lays the ſtraw in ſuch manner as may be eaſily gathered up for binding; ten guineas.

The Machine, with Certificates that at leaſt three acres have been cut by it, to be produced to the Society on or before the ſecond Tueſday in December, 1785.

Simplicity and cheapneſs in the conſtruction, will be conſidered as principal parts of its merit.

101. CURING SCAB IN SHEEP. To the perſon who ſhall diſcover to the Society the moſt efficacious method of curing the diſorder called the *Scab in Sheep*, verified by repeated trials; the ſilver medal, or ten guineas.

CER-

CERTIFICATES of the cure, with an account and deſcription of the diſeaſe, to be delivered to the Society, on or before the ſecond Tueſday in January, 1786.

102. DESTROYING THE GRUB OF THE COCKCHAFER. To the perſon who ſhall diſcover to the Society an effectual method, verified by repeated and ſatisfactory trials, of deſtroying the Grub of the Cockchafer, ſo deſtructive to the roots of all ſorts of Corn, Peaſe, Beans, and Turneps; the gold medal.

The Accounts to be produced on or before the firſt Tueſday in January, 1786.

*Premiums*

*Premiums for Diſcoveries and Improvements in Chymiſtry, Dying, and Mineralogy.*

103. KELP. For the greateſt quantity, not leſs than four tons, of Kelp, containing a much larger proportion of Alkaline Salt than any Kelp now made for ſale; twenty pounds.

A ſpecimen, of one hundred weight, to be produced on or before the firſt Tueſday in January, 1786; together with Certificates that the whole quantity is equal to the ſpecimen, and made in Great-Britain or Ireland, of Sea-weed.

104. BARILLA. For the greateſt quantity of merchantable Barilla, not leſs than half a ton, made from Spaniſh Kali, raiſed in Great-Britain; the gold medal.

A ſample, of not leſs than twenty-eight pounds, with a Certificate that half a ton has

has been made, to be produced on or before the firſt Tueſday in January, 1786.

105. PRESERVING SEEDS OF VEGETABLES. For the beſt method of preſerving the Seeds of Plants in a ſtate fit for vegetation, a longer time than has hitherto been practiſed, ſuch method being ſuperior to any known to the publick, and verified by ſufficient trial; to be communicated to the Society on or before the firſt Tueſday in December, 1785; the gold medal.

106. DESTROYING SMOKE. For the beſt account, aſcertained by proper experiments, of a method of deſtroying or burning the ſmoke of fires belonging to Steam-engines, Furnaces employed in calcining or ſmelting metals, or other large works, in order to prevent annoyance to the neighbourhood; to be produced on or before the firſt Tueſday in January, 1786; the gold medal.

107. SUB-

107. SUBSTITUTE OR PREPARATION OF YEAST. For diſcovering to the Society an effectual Subſtitute for Yeaſt, or Preparation of Yeaſt, for fermenting liquors, and raiſing bread, that may be preſerved for uſe, better than any hitherto generally known; the gold medal, or twenty pounds.

Specimens of the Subſtitute, or of the Preparation of Yeaſt, ſufficient for trials, together with a paper ſealed up, and containing an account of the compoſition of the Subſtitute, or method of preparing the Yeaſt, to be produced on or before the laſt Tueſday in November, 1785.

108. INCREASING STEAM. To any perſon who ſhall diſcover to the Society a method, verified by actual experiments, of encreaſing the quantity, or the force, of Steam, in Steam-Engines, with leſs fuel than is uſually employed, provided that in general the whole amount of

of the expences in uſing Steam-Engines may be conſiderably leſſened; the gold medal.

To be communicated to the Society on or before the firſt Tueſday in January, 1786.

N. B. As it is well known there are methods of preventing the ebullition of liquids, by the addition of particular matters in the boiling, it is ſubmitted to the conſideration of the ingenious, whether, by the addition of ſome matters, or by ſome mechanical operations, the boiling and evaporation may not be increaſed.

109. The ſame premium is extended one year further. To be communicated to the Society on or before the firſt Tueſday in January, 1787.

110. METHOD

110. METHOD OF COMPARING SWEETS. To the perſon who ſhall diſcover to the Society an Index or practical method of comparing, meaſuring, and aſcertaining the degrees of Sweetneſs in ſaccharine ſubſtances; the gold medal.

To be produced on or before the firſt Tueſday in January, 1786.

111. PREVENTING THE DRY ROT IN TIMBER. To the perſon who ſhall diſcover to the Society, the cauſe of the Dry Rot in Timber, and diſcloſe a certain method of prevention, ſuperior to any hitherto known; the gold medal.

The accounts of the cauſe and method of prevention, confirmed by repeated experiments, to be produced to the Society on or before the ſecond Tueſday in December, 1785.

112. The

112. The ſame premium is extended one year further.

The Accounts to be produced on or before the ſecond Tueſday in December, 1786.

113. BRONZE FOR COPPER MEDALS. To the perſon who ſhall diſcover to the Society a method of bronzing Copper Medals, equal to that practiſed in France; the gold medal.

To be produced to the Society on or before the ſecond Tueſday in December, 1785.

*Premiums*

*Premiums for Promoting the Polite Arts.*

114. HONORARY PREMIUMS FOR DRAWINGS. For the beſt drawing of any kind, made with crayons, chalk, black lead, pen, Indian ink, or biſter, by young gentlemen under the age of twenty-one, ſons or grandſons of Peer or Peereſſes, in their own right, of Great-Britain or Ireland; to be produced on or before the firſt Tueſday in March, 1786; the honorary medal of the Society in gold.

115. The ſame in ſilver for the ſecond in merit.

116, 117. The ſame premiums will be given, on the like conditions, to young ladies, daughters or grand-daughters of Peers or Peereſſes, in their own right, of Great-Britain or Ireland.

118. HONO-

118. HONORARY PREMIUMS FOR DRAWINGS. For the beſt drawings of any kind, made with crayons, chalk, black lead, pen, Indian ink, or biſter, by young gentlemen under the age of twenty-one; the gold medal.

To be produced on before the firſt Tueſday in March, 1786.

119. For the next in merit; the ſilver medal.

120, 121. The ſame premiums will be given for drawings by young ladies.

N. B. Perſons profeſſing any branch of the Polite Arts, or any buſineſs dependent on the arts of deſign, or the ſons or daughters of ſuch perſons, will not be admitted candidates in theſe claſſes.

*The following Premium is offered in conformity to the Will of the late John Stock, of Hampſtead, Eſq.*

122. DRAWING OF STATUES.

For the beſt-finiſhed Drawing, after the Statues of Mars and Venus, executed by Mr. Bacon, in the Society's poſſeſſion, the figures to be not leſs then ſixteen inches high, to be made with chalk, black lead, pen, or Indian ink; and to be produced on or before the third Tueſday in October, 1785; the ſilver medallion, with the following engraved inſcription: *The Premium given by the Society for the Encouragement of Arts, Manufactures, and Commerce, in conformity to the Will of John Stock, of Hampſtead, Eſq.*

N. B. Such candidates as propoſe to draw for this premium, will be admitted by the Regiſter, any day, Sundays excepted, from twelve to two, from Monday

day June 13th, to Saturday October 8th, 1785, inclusive.

The drawing to which the premium is adjudged is to remain the property of the Society.

123. DRAWINGS OF OUTLINES. For the best Outline after an original group or cast in plaster of human figures, by persons of either sex under the age of sixteen, the principal figure not less than twelve inches; to be produced on or before the last Tuesday in October, 1785; the greater silver pallet.

124. For the next in merit, the lesser silver pallet.

N. B. These drawings are to be made on paper with chalk, black lead, Indian ink, or bister; and the originals either to be produced to the Society, or to be referred to for their examination.

125. DRAWINGS AFTER PICTURES. For the beſt drawing after a Picture of a Group of Human Figures, the principal figure not leſs than ſixteen inches, by perſons of either ſex under the age of ſixteen; to be produced on or before the laſt Tueſday in October, 1785; the greater ſilver pallet.

126. For the next in merit, the leſſer ſilver pallet.

The drawings to be made with Indian ink, chalk, or black lead, and of a different ſize from the original, which muſt be produced at the ſame time.

127. DRAWINGS OF MACHINES. For the beſt perſpective drawing, by perſons of either ſex, under the age of twenty-one years, of the Piedmont Silk-Reel, in the Society's Repoſitory, the greater ſilver pallet; to be produced on or

or before the third Tueſday in October, 1785.

N. B. Such candidates as propoſe to draw for this premium will be admitted by the Regiſter any day (Sundays or Wedneſdays excepted) between the hours of ten and two.

The drawing to which the premium is adjudged, is to remain the property of the Society.

128. DRAWINGS OF BEASTS. For the beſt drawing and compoſition of three or more Beaſts after nature, the principal figure to be not leſs than eighteen inches, by perſons of either ſex, under the age of eighteen years; to be made with chalk, black lead, pen, Indian ink, biſter, crayons, or water-colours; to be produced on or before the third Tueſday in October, 1785; the greater ſilver pallet.

129. For the next in merit, the leſſer ſilver pallet.

130. DRAWINGS OF BIRDS. For the beſt drawing and compoſition after nature of not leſs than three different Birds, to be made with crayons or water-colours, by perſons of either ſex, under the age of eighteen years; to be produced on or before the third Tueſday in October, 1785; the greater ſilver pallet.

131. For the next in merit, the leſſer ſilver pallet.

132. DRAWINGS OF FRUIT, FLOWERS, OR PLANTS. For the beſt drawing, after nature, of Fruit, Flowers, or Plants, to be made with crayons, or water-colours, by perſons of either ſex, under the age of ſixteen; to be produced on or before the third Tueſday in October, 1785; the greater ſilver pallet.

133. For the next in merit, the leſſer ſilver pallet.

134. DRAW-

134. DRAWINGS OF LANDSCAPES. For the beſt drawing of Landſcapes after nature, by perſons of either ſex, under twenty-one years of age; to be produced on or before the third Tueſday in October, 1785; the greater ſilver pallet.

135. For the next in merit, the leſſer ſilver pallet.

Each candidate muſt mention, on the front of his drawing, from whence he took his view; and the drawings muſt be made with chalk, pen, Indian ink, or biſter.

136. HISTORICAL DRAWINGS. For the beſt Hiſtorical Drawing, being an original compoſition of five or more human figures; the height of the principal figure not leſs than eight inches; to be made with crayons, chalk, black lead, pen, Indian ink, or biſter, and to

be produced on or before the third Tuesday in October, 1785; the gold pallet.

137. For the next in merit, the greater ſilver pallet.

To

*To the Maſters of Academies or Schools.*

138. TEACHING LANGUAGES. Whereas it has been obſerved that the living languages, or languages ſpoken in ſchools, are much ſooner acquired than the dead languages, which are only taught grammatically;

The Society, deſirous to improve the preſent mode of education, hereby offers the gold medal to the Maſter of any Academy, or School for boys, ſituated within, or not more than thirty miles diſtant from London, who ſhall, within three years from the date of this advertiſement, teach the greateſt number of ſcholars, not leſs than four, to write, and to ſpeak Latin, in common converſation, correctly and fluently.

139, 140, 141. Alſo the gold medal for teaching, in the like manner, each

each of the following languages, viz. the German, the Spaniſh, and the Italian, being commercial languages, not uſually taught at ſchools in England.

The maſters who propoſe to be candidates for the above premiums, are to ſend notice of their intention to claim them, to the Society, at their houſe in the Adelphi, on or before the the ſecond Tueſday in November, 1786; ſoon after which, the Society will appoint a day for examining the young gentlemen, and for adjudging the ſaid claims.

142, 143, 144. And in order to encourage aſſiduity in the ſcholars, whoſe maſters apply for the above premiums, the Society will give to the greateſt proficient in each of the ſaid languages, the ſilver medal.

N. B. Any information for the further improvement of the education of youth, in languages, will be thankfully received.

CONDI-

## CONDITIONS.

No perſon who has gained the firſt premium in any claſs, will be admitted a candidate in a claſs of an inferior age; and no candidate ſhall receive more than one premium in one year; nor will they who, for two ſucceſſive years, ſhall gain the firſt premium in one claſs, be ever again admitted as candidates in that claſs.

No perſon ſhall ever be admitted a candidate in any claſs, in which he has three times obtained the whole of the firſt premium.

No candidate ſhall ſend in more than one performance in any one claſs.

All the claims which are produced each year, before the Committee of Polite Arts (to which premiums or bounties are adjudged) are to remain with the Society ſix weeks after the determination, unleſs the

the candidates, for particular reaſons, do apply to have the performance returned.

No claim for a premium in the Polite Arts will be admitted, that has obtained, or has been produced in order to obtain a premium, reward, or gratification, from any other Society, or any academy or ſchool.

All performances that obtain premiums in the Polite Arts, muſt be begun after the publication of ſuch premiums.

Purpoſely to encourage real merit, and to prevent any attempts to impoſe on the Society, by producing drawings which ſhall have been made or retouched by any other perſon than the candidate, the Society is reſolved upon all occaſions, with reſpect to the ſucceſsful candidates in claſſes 122 to 137 incluſive, to prove their abilities, by requiring a ſpecimen made under the inſpection of the Committee of Polite Arts, in every inſtance where ſuch proof can be obtained.

*Premiums*

*Premiums for encouraging and improving Manufactures.*

145. SILK. For the greateſt quantity of merchantable Silk, not leſs than five pounds, produced by any one perſon in England, in the year 1785; the gold medal.

Specimens of the Silk, not leſs than one pound, with Certificates that the whole is of equal quality, and produced in England, to be delivered to the Society on or before the firſt Tueſday in January, 1786.

146. For the ſecond greateſt quantity, not leſs than two pounds, the ſilver medal.

147. MACHINE FOR CARDING SILK. For the beſt machine, ſuperior to any now in uſe, for carding waſte Silk equally well as by hand; to be produced, together

together with a ſpecimen of the Cardings, on or before the firſt Tueſday in November, 1785; the gold medal, or twenty pounds.

148. WEAVING FISHING-NETS. For the beſt ſpecimen of plain netting, for Fiſhing-Nets, not leſs than twenty yards long and ſix feet deep, woven in a loom, or other machine; to be produced to the Society on or before the ſecond Tueſday in January, 1786; twenty guineas.

N. B. It is expected that the ſpecimen produced, be made in ſuch a manner, as to be cut and joined without more loſs than uſual; that it have ſuch a plain ſelvage as the common fiſhing-nets; and that the knot be equally faſt with thoſe in nets in common uſe, and as eaſily repaired.

149. PAPER

149. PAPER FOR COPPER-PLATES. To the perſon who ſhall eſtabliſh in England or Wales, a manufacture of paper, equal to the paper imported from France, proper for receiving impreſſions from mezzotinto, and other engraved copper-plates, and produce to the Society one ream, of the dimenſions of the French *ſuper-royal*, on or before the firſt Tueſday in November, 1785; the gold medal.

CERTIFICATES muſt be produced, to the ſatisfaction of the Society, that the paper was made in England or Wales.

150. A ſtrong CLOTH being prepared in SWEDEN, from HOP STALKS or BINDS, the Society will give the gold medal, or twenty pounds, as a premium for the beſt and greateſt quantity of ſuch Cloth, not leſs than twenty-five yards, made in England, and produced to the Society

Society on or before the ſecond Tueſday in December, 1787.

One pound at leaſt of the Thread to be produced with the claim.

*Premiums*

*Premiums for Inventions in Mechanicks.*

151. TRANSIT INSTRUMENT. To the perſon who ſhall invent and produce to the Society, a cheap and portable Tranſit inſtrument, which may eaſily be converted into a Zenith Sector, capable of being accurately and expeditiouſly adjuſted for the purpoſes of finding the latitudes and longitudes of places, and ſuperior to any portable Tranſit inſtrument now in uſe; the gold medal; to be produced on or before the laſt Tueſday in January, 1786.

152. GUN HARPOON. For every Whale taken by means of the Gun Harpoon, to the perſon who firſt ſtrikes ſuch fiſh therewith, two guineas.

N. B. Proper Certificates of the taking ſuch Whales, in the year 1785, ſigned by the maſter, or by the mate when

the claim is made by the maſter, to be delivered to the Society on or before the laſt Tueſday in December, 1785.

153. GUN FOR THROWING HARPOONS. To the perſon who ſhall produce to the Society, the beſt improvement in the conſtruction of a Gun for throwing Harpoons, ſo as to render it more manageable than thoſe at preſent in uſe; the ſilver medal, or ten guineas.

To be delivered to the Society on or before the firſt Tueſday in December, 1785.

154. HARPOON TO BE THROWN BY A GUN. To the perſon who ſhall produce to the Society, the beſt improvement in the conſtruction of a Harpoon to to be thrown by a Gun; the Harpoon to be ſo contrived, that it may ſtrike and hold the fiſh with more certainty and greater effect than any hitherto made uſe of; the ſilver medal, or ten guineas.

To

To be delivered to the Society on or before the firſt Tueſday in December, 1785.

155. MACHINE FOR TRANSPORTING TIMBER. To the perſon who ſhall produce to the Society a model of the beſt, moſt ſimple, and cheap Machine or Carriage for tranſporting Timber, or other heavy materials, on ſoft or clayey roads, at the leaſt expence; to be ſent in on or before the laſt Tueſday in November, 1785; twenty guineas.

156. IMPROVEMENT OF THE HAND VENTILATOR. To the perſon who ſhall produce to the Society, on or before the laſt Tueſday in February, 1786, a portable Ventilator, to be worked by hand, better adapted and more efficacious for extracting foul air from gaols, priſons and ſhips, than any now known or in uſe; the gold medal.

157. ENGINE FOR WORKING LOOMS. To the perſon who ſhall invent and conſtruct an Engine for the purpoſe of working at one time, the greateſt number of looms, not fewer than three, for weaving ſilk, woollen, linen, or cotton goods (equally well, and more expeditiouſly than by hand, or by any other method now in uſe), each piece to be not leſs than half a yard wide; the gold medal, or thirty guineas.

CERTIFICATES of the working ſuch Engine, with ſamples, not leſs than one yard long, to be produced on or before the firſt Tueſday in January, 1786.

158. CRANES FOR WHARFS. To the perſon who ſhall invent and produce to the Society, a model of a Crane for Wharfs, on a ſcale of not leſs than one inch to a foot, the conſtruction to be ſuch, that the power may be varied according to the weight to be raiſed, in a more

more ſimple and effectual manner than by any now known or in uſe; the gold medal, or twenty guineas.

To be produced on or before the firſt Tueſday in February, 1786.

N. B. The model ſhould neither be of the walking wheel nor capſtan kind.

159. MACHINE FOR CLEARING RIVERS. For the beſt model of a machine, ſuperior to any now in uſe, for Clearing Navigable Rivers from Weeds, at the leaſt expence; ten guineas.

To be produced to the Society on or before the firſt Tueſday in February, 1786.

*Premiums offered for the Advantage of the Britiſh Colonies.*

160. NUTMEGS. For the greateſt quantity of merchantable Nutmegs, not leſs than five pounds weight, being the growth of his Majeſty's dominions in the Weſt Indies, and nearly equal to thoſe imported from the iſlands of the Eaſt-Indies; the gold medal, or one hundred pounds.

Satisfactory certificates from the governor, lieutenant-governor, preſident of the council, or ſpeaker of the houſe of aſſembly, of the place of growth, with an account of the number of trees, their age, nearly the quantity of fruit on each tree, and the manner of culture, to be produced on or before the firſt Tueſday in January, 1786.

161. The

161. The ſame premium is extended one year further.

CERTIFICATES to be produced on or before the firſt Tueſday in January, 1787.

N. B. Any perſon deſirous of information on the ſubject of Nutmeg Trees, may obtain it from a memorial on the fructification of the Nutmeg, and the ſureſt method of cultivating it to advantage, by the King's Gardener, at the Iſle of Bourbon, inſerted in Mr. Maty's Review, for Auguſt, 1783.

162, 163. BREAD-FRUIT TREE. To the perſon or perſons who, between the firſt of June, and the fifteenth of Auguſt, 1786, ſhall bring into the port of London the greateſt number of plants of one or both ſpecies of the Bread-Fruit Tree, in a growing ſtate, not leſs than three of either ſpecies; the gold medal.

164, 165. The ſame premiums are extended one year further; the plants to be brought into the port of London, between the firſt of June, and the fifteenth of Auguſt, 1787.

N. B. The plants which obtain the premiums are to be the property of the Society, to be diſpoſed of according to their diſcretion.

THE SOCIETY being informed that a conſiderable quantity of oil can be obtained from the Seed of Cotton, and that, after the expreſſion of the oil, the remaining cake will afford a ſtrong and hearty food for cattle; and likewiſe, that the apparatus for the operation can be applied to the mill for ſugar-canes, and worked in the rainy ſeaſon, at a moderate expence, have reſolved, for the foregoing reaſons, that the procuring oil from the Seed of Cotton is a proper object of a premium, conſidered as an encouragement

ment for Planters to extend the cultivation of Cotton, an article eſſentially requiſite to increaſe the manufacture of that commodity in this country.

The Society therefore offer as follows:

166. OIL FROM COTTON SEED. To the Planter in any of the Britiſh Iſlands of the Weſt Indies, who ſhall expreſs oil from the Seed of Cotton, and make from the remaining ſeed hard and dry cakes, as food for cattle; the gold medal.

CERTIFICATES that not leſs than one ton of the oil has been expreſſed, and five hundred weight of the cakes obtained, to be produced to the Society, with two gallons of the oil, and two dozen of the cakes, together with a full account of the proceſs, on or before the laſt Tueſday in November, 1785.

167. For

167. For the next greateſt quantity, not leſs than half a ton, of oil, and two hundred weight of the cakes; the ſilver medal.

168, 169. The ſame premiums are extended one year further.

CERTIFICATES and ſamples to be produced on or before the laſt Tueſday November, 1786.

170, 171. The ſame premiums are extended one year further.

CERTIFICATES and ſamples to be produced on or before the laſt Tueſday in November, 1787.

172. SPIRIT FROM THE PULP OF THE COFFEE BERRY. To the Planter in any of the Britiſh Iſlands in the Weſt Indies, who ſhall diſtill the greateſt quantity of Spirit, from the Pulp of the Coffee

Coffee Berry, not leſs than thirty gallons, and produce to the Society one gallon of the Spirit, together with an account of the proceſs uſed in the making it; the gold medal.

173. For the next greateſt quantity, not leſs than fifteen gallons; the ſilver medal.

CERTIFICATES, ſigned by the governor, lieutenant-governor, or ſome perſons of known credit in the iſland, to be delivered to the Society on or before the firſt Tueſday in January, 1786.

174. The ſame premiums are extended one year further.

CERTIFICATES and ſamples to be produced on or before the firſt Tueſday in January, 1787.

175. SENNA.

175. SENNA. To the perſon who ſhall import into the port of London, in the year 1786, the greateſt quantity of Senna, not leſs than two hundred weight, the growth of any of the Britiſh Iſlands in the Weſt Indies, and equal to the *Alexandrian Senna*, now uſed for medicinal purpoſes; the gold medal.

CERTIFICATES of the growth and method of culture, to be produced to the Society, on or before the firſt Tueſday in February, 1787.

176. The ſame premium is extended one year further.

CERTIFICATES to be produced on or before the firſt Tueſday in February, 1788.

GENERAL

## GENERAL CONDITIONS.

Notwithſtanding the Society reſerve to themſelves the power of giving, in all caſes, ſuch part only of any premium as the performance ſhall be adjudged to deſerve, or of withholding the whole, if there be no merit; yet the Candidates may be aſſured, the Society will always judge liberally of their ſeveral claims.

It is required, that the matters for which premiums are offered, be delivered in without names, or any intimation to whom they belong; that each particular thing be marked in what manner each claimant thinks fit, ſuch claimant ſending with it a paper ſealed up, having on the outſide a correſponding mark, and on the inſide the claimant's name and addreſs.

No papers ſhall be opened, but ſuch as ſhall gain premiums, unleſs where it appears to the Society abſolutely neceſſary for the determination of the claim: all the reſt ſhall be returned unopened, with the matters to which they belong, if inquired after by their marks within two years; after which time, if not demanded, they ſhall be publicly burnt, unopened, at ſome meeting of the Society.

All models of machines, which obtain premiums or bounties, for the future, ſhall be the property of the Society.

All the premiums of this Society are deſigned for that part of Great Britain called England, the dominion of Wales, and the town of Berwick upon Tweed, unleſs expreſsly mentioned to the contrary.

The claims ſhall be determined as ſoon as poſſible after the delivery of the ſpecimens.

No

No perſon ſhall receive any premium, bounty, or encouragement, from the Society, for any matter for which he has obtained, or propoſes to obtain, a patent.

A candidate for a premium, or a perſon applying for a bounty, being detected in any diſingenuous method to impoſe on the Society, ſhall forfeit ſuch premium or bounty, and be deemed incapable of obtaining any for the future.

The performances which each year obtain premiums or bounties, are to remain with the Society until the end of May, except as mentioned in the conditions annexed to the premiums offered for promoting the Polite Arts.

No member of this Society ſhall be a candidate for, or entitled to receive any premium, bounty, or reward whatſoever, except the honorary medal of this Society.

Where

Where Certificates are required to be produced in claim of premiums, they ſhould be expreſſed as nearly as poſſible in the words of the reſpective advertiſements, and ſhould not be from the candidate (ſolely), but from ſome other perſon, or perſons, who have a poſitive knowledge of the facts certified.

Where premiums, or bounties, are obtained, in conſequence of ſpecimens produced, the Society mean to retain ſuch part as they may judge neceſſary, making a reaſonable allowance for the ſame.

No Candidates ſhall be preſent at any meetings of the Society or Committees, or admitted at the Society's rooms, after they have delivered in their claims, till ſuch claims are adjudged, unleſs ſummoned by the Committee.

N. B. Any information or advice that may forward the deſigns of this Society for

for the publick good, will be received thankfully, and duly conſidered, if communicated by letter, addreſſed to the Society, and directed to Mr. More, the Secretary, at the Society's Office, in the Adelphi Buildings, London.

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*** In caſe any perſon ſhould be inclinable to leave a ſum of money to this Society, by will, the following form is offered for that purpoſe.

*Item.* I give and bequeath unto A. B. and C. D. the ſum of upon condition and to the intent, that they, or one of them, do pay the ſame to the Collector, for the time being, of a Society in

 London,

London, who now call themſelves the Society for the Encouragement of Arts, Manufactures, and Commerce; which ſaid ſum of I will, and deſire may be paid out of my perſonal eſtate, and applied towards carrying on the laudable deſigns of the Society.

By order of the Society,

SAMUEL MORE, Secretary.

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## DIRECTIONS TO THE BOOKBINDER.

Place the Portrait of Lord Romney as Frontiſpiece to the Volume.

Plate of Mr. Braithwaite's Crane to face page 159.

Plate of Mr. Marſhall's Secret Eſcutcheon to face page 163.

**Mr Wm SHIPLEY,**

*whose Public Spirit gave rise to the*

**Society Instituted at London,**

*for the*

*Encouragement of Arts, Manufactures*

*and Commerce.*

# TRANSACTIONS

OF THE

# SOCIETY

INSTITUTED AT LONDON,

FOR THE

# ENCOURAGEMENT

OF

# ARTS, MANUFACTURES, and COMMERCE;

WITH THE

PREMIUMS offered in the YEAR 1786.

VOL. IV.

THE SECOND EDITION.

LONDON:

Printed by T. SPILSBURY and SON, Snow-hill.

To be had, by MEMBERS, of the REGISTER, at the SOCIETY'S HOUSE, in the ADELPHI; and sold by Messrs. DODSLEY, HOOPER, ROBSON, WHITE, BECKET, JOHNSON, CADELL, ELMSLEY, WALTER, RICHARDSON, DEBRETT, SEWELL, and TAYLOR.

M.DCC.XCIII

# PREFACE.

THE Society, with great pleaſure, obſerve the regard paid by the Publick to the Volumes of their Tranſactions already publiſhed. The firſt, printed in the year 1783, is now out of print; and very many of the Volume printed in 1784, are already ſold; for as members on their election are entitled only to the volume printed in that year in which they are elected, almoſt the whole of thoſe choſen ſince 1783, have purchaſed the preceding books: and the great encreaſe of members ſince the Society thought proper to print their Tranſactions, may be with juſtice attributed to the circumſtance of publiſhing theſe Volumes.

By publications of this kind, knowledge in Agriculture and the various branches in different Arts is diſſeminated; and whoever views the preſent ſtate of theſe Kingdoms, and compares the appearance of the ſeveral Counties with what it was thirty years ago, will have reaſon to rejoice at the improvement made within that time, not only in Agriculture, but in thoſe Mechanical and Chemical Arts by which the Trade and Commerce of the Kingdom is and muſt be ſupported againſt any rivals who may endeavour to ſupplant it.

To this kind of knowledge, added to a good taſte ſpread among Artiſts by the premiums diſtributed for their encouragement, and among the Nobility and Gentry by the honorary marks of diſtinguiſhing approbation, the Society have conferred on their performances, is in a very great degree owing the elegance found in the

the ornamental parts of furniture, carriages, &c. And here muſt not be omitted the advantages the Commerce of this Country has received from the exportation in very great quantities of the Engravings and Mezzotinto Prints, executed by our artiſts, which are now in high eſtimation even in thoſe Countries that formerly ſupplied all Europe.

In the Mechanical Arts, this Country ſtands high in repute; and at the ſame time that it muſt be acknowledged a ſingular honour that one of our Artiſts has been employed to furniſh to France the largeſt and moſt uſeful apparatus modern times can boaſt of; it muſt be alſo allowed, that that Kingdom has ſhewn great liberality by employing a native of any other country than their own to execute it.

The ſubject here alluded to is the mode lately adopted at Paris of ſupply-

ing that City with Water by means of Steam Engines and caſt Iron Pipes; all which have been furniſhed from England.

The great exportation alſo of Clocks and other ſmaller machines to Turkey and the Eaſt Indies, and even to Germany, may ſerve as a further and convincing proof how neceſſary it is to encourage that attention to Mechanicks, which is ſo general in this Conntry, and which fortunately for us is found to be daily encreaſing.

The following Papers are, as in the former Volumes, divided into ſeparate heads, and arranged under thoſe claſſes into which the premiums offered by the Society have conſtantly been divided.

In the claſs of Agriculture, are inſerted papers which it is believed may throw ſome light on that important and much controverted ſubject in Agriculture,

the

the comparative advantage of the Drill and Broad-caſt Huſbandry.

An account is alſo given of the culture by different perſons of a large kind of Hemp from China; and as ſome more of the ſeed has been received from the honourable Eaſt-India Company, and properly diſtributed, further experiments on that Plant may be expected to make part of a ſubſequent Volume.

The advantages which theſe Iſlands muſt reap from the gaining and ſecuring Land from the Sea, are obviouſly many and important; and in conſequenee of a premium offered, the Society have received a ſatisfactory account of a conſiderable quantity of land thus gained, which, it is hoped, will prove very acceptable to every reader.

Some further obſervations are here inſerted relative to the culture of the Tur-

nep-rooted Cabbage, a plant firſt introduced to the Publick by the late Mr. Reynolds of Addiſham in Kent, under the encouragement of the Society, and now coming into general uſe for the material purpoſe of ſpring food for cattle; and as by a letter inſerted in this Volume it is clearly proved that the ſevere froſts of the moſt northern parts of the Iſland of Great Britain, are not injurious to this vegetable, it is eaſy to foreſee the great advantages that will accrue to the inhabitants of that part of the iſland from the cultivation of it.

Under the head of Chemiſtry is inſerted an Eſſay on Portable Furnaces, giving a ſhort account of the original contrivance, and a curſory detail of the ſeveral Kinds hitherto moſt in uſe, at the ſame time pointing out a cheap and eaſy mode of making them more commodious in their conſtruction and uſe.

This

This, it is hoped, will induce gentlemen of fortune and leiſure, to attend to experiments in the Chemical line, which, at the ſame time that they ſupply an inexhauſtible fund of amuſement, are conſtantly furniſhing matter for the employment of the induſtrious, by eſtabliſhing new Manufactures, and thereby varying and encreaſing the Commerce of the Kingdom.

In the claſs of Polite Arts, it has been thought fit to publiſh an account of the curious invention of a blind young man, contrived by him for the purpoſe of performing the various Rules of Arithmetic. Every humane mind will rejoice to find a method diſcovered for the entertainment and employment of thoſe who labour under the dire misfortune of want of ſight; and when we obſerve how many perſons in that unhappy predicament have ſucceded in their application

to muſical ſtudies, there is reaſon to hope arithmetical purſuits, which are in many inſtances nearly allied to them, may reap ſome conſiderable advantages from this invention.

An endeavour to propagate the Silk-worm, and inſtitute a manufactory of Silk in this Kingdom, has long been an object of the wiſhes, not only of this Society, but of Government itſelf; as fully appears by the curious and learned paper of the Honourable Daines Barrington, inſerted in the ſecond volume of theſe Tranſactions, page 172; where it appears that attempts to introduce that buſineſs into this Country, were made ſo long ſince as the reign of James the Firſt.

In the ſecond volume were publiſhed ſeveral Letters from Mrs. Williams of Graveſend, on that ſubject; and under the claſs of Manufactures in this Volume,

lume, will be found two Letters from a young lady, who, with an attention and aſſiduity that deſerve the higheſt commendation, has applied herſelf to the making ſuch experiments as ſeem likely to aſcertain with preciſion that queſtion ſo long and ſo often agitated, whether the production of Silk in this Climate can ever be brought to ſuch perfection, and carried on upon ſuch a ſcale, as to render it an object of public utility. Whatever hereafter Miſs Rhodes ſhall communicate on that head, ſhall make a part of the future volumes of theſe tranſactions.

Under the head of Mechanicks, the reader will find a deſcription and plate of a Chime-Clock on a more ſimple and leſs expenſive plan than thoſe generally made; and when the number of Clocks that make an article of trade to the Eaſt Indies and the Levant is conſidered,

ſidered, any improvement in their conſtruction muſt be deemed worthy the public attention. Under this claſs alſo are inſerted two letters ſhewing the advantage (and pointing out proper methods) of ſecuring Ricks of hay and corn, during the making: the utility of ſuch contrivances are ſo evident, that it is ſurprizing the uſe of them has not long ſince been univerſally adopted. Here too will be found an hiſtory of the invention and an account of the conſtruction of an artificial Horizon to be uſed on land. When it is conſidered how few of the inventors of uſeful Machines are now known even by name, it may ſerve as an additional inducement to ingenious perſons to communicate their inventions to the Society; as future ages will be able, by their names being thereby properly recorded, to beſtow on them thoſe praiſes their labours are entitled to.

In

In the claſs of Colonies and Trade, will be found ſome letters from Barbados and Nevis, giving an hiſtorical account of the introduction of that uſeful and much-eſteemed fruit, the Mango Plumb, into thoſe and other of the Weſt-India iſlands, which, when the many uſes that ſpecies of fruit is applied to, and the high eſtimation it is held in the Eaſt Indies, is conſidered, may be reckoned a very valuable acquiſition: yet this circumſtance will ſeem much leſſened in its conſequence, on the publick being informed with a due degree of authority that not only the Cinnamon-Tree, as will appear by the letter from Mr. Wilſon, but a great number of other valuable Plants, the natives of the Spice Iſlands in the Eaſt, are happily planted and growing in a luxuriant ſtate in Jamaica, owing to the care and attention of Lord Rodney, who, during his ever-memorable and

and ſucceſsful cruize in the Weſt Indies in the courſe of the late war, ordered a ſhip which the French had purpoſely ſent from the Iſle of Bourbon to Martinique, with thoſe plants on board, but which was fortunately taken by one of his Lordſhip's cruiſers, to be immediately ſent to Jamaica, and the plants placed under the care of a proper gardener. Thus that Iſland is become poſſeſſed of what there is reaſon to believe will one day prove a ſource of wealth to that Colony and to the Mother Country.

A liſt of the contributing Members is this year inſerted at large; and among the premiums offered to the Publick, will be found ſeveral that have not appeared before, two of which it may not be improper to ſpeak of in this place; that offered for a Diſſertation on the nature and properties of Alkaline Salts, and

and that on making Paper from Raw Vegetables. From the improved ſtate of Chemiſtry in this Country, the nature of the Alkaline Salts made uſe of in many Manufactures have become objects of conſideration among the workmen; and it is now known to them, that, from the different properties of the two kinds of thoſe ſalts known by the names of vegetable and mineral Alkali, or more uſually Pearl Aſh and Barilla, very eſſential differences take place in their works, even when the ſubſtances are unadulterated: but the ſophiſtications to which they are liable, are ſo many and ſo various, that it has been with great truth ſuppoſed an eaſy method of purifying and ſeparating them from all heterogeneous matters, and diſcovering their inherent and eſſential differences, would be of very great ſervice; and for that purpoſe a conſiderable premium will be found offered at

Claſs

Claſs 109. Another new object of Reward is in the claſs of Manufactures, No. 155, where a premium is offered for manufacturing paper from vegetable ſubſtances not previouſly made into cloth. The very great conſumption of paper, of all kinds, in theſe Kingdoms, and the circumſtance of an edict, ſome time ſince publiſhed in one of the foreign Countries, prohibiting the exportation of linen rags, rendered it neceſſary to conſider whether any method could be adopted to eſtabliſh a Paper Manufactory on a principle different from the common one: and fortunately the Society had ſome years ſince received from one of their correſponding members (Mr. Jacob Chriſtian Schaffers, of Regenſburg) a conſiderable number of ſpecimens of papers made of Raw Vegetables, which appeared of ſuch qualities as to furniſh hints for introducing a new mode of making ſo

uſeful

uſeful an article as paper; and hence has ariſen the idea of offering a premium on this ſubject.

It is hoped the ſeveral eſſays in the following ſheets will ſerve to point out the utility of theſe publications, and be the means of inducing perſons of talents to communicate to the world, in the future volumes of theſe Tranſactions, ſuch obſervations as they may make reſpecting the improvements of the Arts, the Manufactures and Commerce of theſe Kingdoms, which are the immediate ſubjects of the Society's conſideration, and which cannot fail to reflect honour upon thoſe who attend to the advancement of objects of ſo great importance.

The print which is affixed as a frontiſpice to this volume, is an exact portrait of the founder of this Society; the

picture from which this print is taken, was painted from the life by Mr. Wm. Hincks, who alſo engraved the copper-plate, and preſented them both to the Society, for the purpoſe of perpetuating the memory, and recording the likeneſs of Mr. WILLIAM SHIPLEY.

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## DIRECTIONS TO THE BINDER.

Place the Portrait of Mr. Shipley to face the Title.
The Print of Mr. Grenville's Machine, page 144.
The Print of Mr. Sampſon's Chime Clock, page 177.

# PAPERS

IN

# AGRICULTURE.

# AGRICULTURE.

THOMAS WHITE, of Retford, in Nottinghamſhire, Eſq. having formed a large plantation of Foreſt-trees on his Eſtate at Butsfield, in the pariſh of Lancheſter, and biſhoprick of Durham, of which a ſhort account is given in the ſecond Volume of the Society's Tranſactions, page 11, (and alſo an account of Medals adjudged to Mr. White, for various trees planted on the ſame eſtate, in the years 1778 and 1779; ſee the ſame Vol. page 4, and 5) did this year become a candidate for the premium offered for planting the greateſt number of ENGLISH ELM: and it appearing, by proper Certificates, dated May 13th, 1784, and

ſigned by the Reverend Robert Dent, Miniſter of Lancheſter, and John Weſt, bailiff to Mr. White, that there had been planted at that place, between the third of February, and the eighth of April, 1784, ten thouſand Engliſh Elm, from one to five feet high, at the diſtance of ſix feet and upwards, in order to raiſe Timber, which are all fenced with a good ſtone wall; and the Trees breaking into leaf in great vigour; the Gold Medal was adjudged to Mr. White, for the ſame.

With the Certificates above mentioned was alſo received the following letter, by which it appears how much attention is paid to theſe plantations, and how much they are annually increaſing.

*Workington,*

*Workington*, June 4th, 1784.

Honoured Sir,

According to your deſire, I have ſent you an account of the Trees this year planted by me upon your eſtate at Butsfield plantations, as they were numbered before their being planted, viz.

| | |
|---|---|
| Alders | 37230 |
| Aſh Mountain | 4000 |
| Beech | 1150 |
| Birch | 62692 |
| Elms | 10000 |
| Firs, Scotch | 35135 |
| Larch | 240523 |
| Weymouth Pines | 6100 |
| Sycamores | 3397 |
| Total | 400227 |

Signed JOHN WEST.

To THOMAS WHITE, Eſq.

*The following Letter was received by the Society, in claim of the premium offered* " to aſcertain whether it is moſt advantageous to cultivate Wheat by ſowing it in the common broad-caſt way, by drilling it in equidiſtant rows, or by dibbling it;" *but the Claimant not appearing to have made any comparative experiments, between the ſowing Wheat in broad-caſt, and drilling or dibbling it, which was an eſſential condition required, his claim could not be admitted: but the Thanks of the Society were given to the Reverend Mr.* CLOSE, *of Trimley, near Ipſwich, the candidate, for the communication of thoſe experiments made by him on a ſubject of ſo much importance to every one concerned in agricultural purſuits.*

SIR,

THE following are the particulars of an experiment, tried upon ſix acres and a half of mixed Loamy Land, in a low

low ſituation, and ſurrounded by Willow trees, which are greatly prejudicial to every crop. On the 16th, 17th, and 18th of October, 1783, ſet half the land with white Wheat, planting two feet two inches, and leaving the ſame ſpace as intervals. Auguſt 29th, 1784, the Wheat was cut and ſtacked; thraſhed this preſent January, and yielded thirty-two coomb of fine Corn, for which I have been offered one pound two ſhillings per coomb, but have not at preſent ſold it. April 26, 1784, the intervals were ſet with the beſt Champion Potatoes: October the 2d, 4th, and 6th, they produced one hundred and forty-eight ſacks of good Potatoes; one hundred ſacks of which were ſold at ſix ſhillings per ſack, and forty-eight for ſeven ſhillings. The three acres and a quarter of Potatoes therefore produced forty-ſix pounds ſixteen ſhillings; and the ſame quantity of land, occupied by the Wheat, muſt be

valued at thirty-five pounds four ſhillings; conſequently the ſix acres and a half, returned one year eighty-two pounds. Add to this the advantage that will accrue from having the ſame Crops this year, only by reverſing them; and I apprehend it muſt greatly exceed the Broadcaſt Huſbandry, on the beſt cultivated lands. Many other advantages ariſe from this method. It employs more productive labourers, and many women and children, that cannot be ſerviceable in the common method of culture. The Wheat was ſet with a frame two feet two inches wide, having ſeven Tines*. *(See the Figure on the oppoſite page.)* The Potatoes were dropped in a furrow made by a ſmall deep-pitched double-breaſted plough, about ten inches from ſet to ſet in the rows.



* Mr. CLOSE has ſince experienced that a frame with FIVE Tines, is preferable to one of SEVEN, in the two feet two inches.

I muſt beg you to communicate the above experiments to the Gentlemen of the Society for the Encouragement of Arts, Manufactures, and Commerce, by which you will oblige,

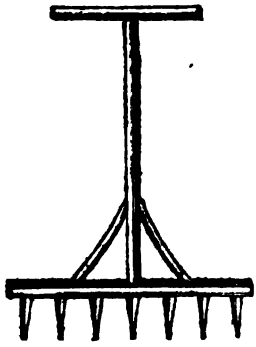
SIR,

Your obedient ſervant,

*Trimley, near Ipſwich*, Jan. 30, 1785.

H. J. CLOSE.

Mr. MORE.



*The*

*The Thanks of the Society were given to* WILLIAM WHITMORE, *of Dudmaſton, near Bridgnorth, Shropſhire, Eſq. for the following Letter on the* Drill Huſbandry; *and to* OWEN SALUSBURY BRERETON, *Eſq. Vice Preſident of the Society, to whom it is addreſſed, for the communication of it.*

To OWEN SALUSBURY BRERETON, Eſq.

*Dudmaſton*, Dec. 29, 1784.

DEAR SIR,

AS the pleaſure you took, while at Dudmaſton, in obſerving the proceſs and management of my little farm, eſpecially in thoſe experiments wherein I have deviated from the beaten track of common culture, led us often to diſcuſs that moſt important conſideration to agriculture, whether the Drill or Broad-caſt Huſbandry,

bandry, in all ſuch ſoils where the Drill may with propriety be adopted, would in reality be the moſt advantageous cultivation, and in what degree it would deſerve the preference; as far as my ſmall experience may authoriſe me to form a judgment, I do not heſitate to decide greatly in favour of the Drill ſyſtem, when properly underſtood; and I will venture to affirm, ſhould ever that method be generally purſued, it will ſoon prove a great national advantage. Should you think the reſult of my few trials, this year, which I promiſed to ſend you, worthy the obſervation of your laudable Society, I ſhall be happy, at all times, to contribute my mite in the reſearches into agricultural improvements.

The ſoil on which I have begun to uſe the Drill Plough, is a good haſle loam, a ſpade's depth, having a ſandy gravelly bottom. In the year 1783, it brought

mo

me a large crop of Turneps, after proper preparation of fallowing, mucking, &c. and they were eat off on the premiſes with ſheep laſt ſpring, when it was twice ploughed; and in the middle of April, I planted on it, with Cook's Drill Machine, at eighteen inches drill, equally united throughout the field, ſix ſtatute acres of Barley, and two of ſpring Wheat, taking ſomething leſs than a buſhel of ſeed to each acre. As ſoon as the grain was completely up, and weeds, eſpecially Charlock, began to appear, (which always before was to me, and is, wherever land is ſubject to it, a great nuiſance to the huſbandman) I had the crop well hoed, two men working Cook's Hoe, walking between the rows, cutting up the weeds, and earthing up the mould to the roots of the grain, by the conſtruction of its make doing, with eaſe, upwards of two acres a day; and it was, on a ſecond appearance of weeds, repeated

over

over again, which made the crop grow ſo vigorous, that you may remember the intervals between the drills were hardly diſcernible. Some few docks, that grew directly in the drill with the grain, were eaſily hand-weeded, and the whole field was as clean as a garden. The exceſſive heavy rains that fell laſt ſummer, injured many ſtrong crops: this, though frequently lodged, roſe again with great vigour. My neighbours, who had reprobated my method of proceeding, and ridiculed the folly of ſowing ſo ſmall a quantity of ſeed, found their prediction of a ſmall Crop, prove the reverſe; for my return was upwards of ſixty buſhels Wincheſter meaſure of Barley, and thirty buſhels of ſpring Wheat, to the acre.

I ſhall therefore obſerve, as the moſt favourable and rich ſpots in theſe environs will not produce, by any broad-caſt ſowing, above fifty buſhels of Barley, that this

this ſyſtem, excluſive of a large crop, has, in reſpect of ſaving of ſeed, evidently the advantage; not only as it regards general benefit, but even individually ſo, in point of œconomy, the two hoeings being well performed for three ſhillings an acre. In reſpect to Wheat, I find twenty-five buſhels reckoned a fair crop, in the beſt diſtricts. I have therefore greater reaſon to recommend it for winter tillage, it ſeldom being required to clover down a corn crop, which is the only objection I know that can militate againſt this method of management; and I muſt obſerve, that more than thirty buſhels of winter-planted corn, may be expected by this proceſs; as many crops, I am informed, by this method turned out forty and fifty buſhels; but I muſt remark, that they were planted at one foot equally diſtant thoughout.

Having,

Having, Sir, troubled you ſo far, permit me to make ſome few remarks, that may perhaps deſerve inveſtigation. It appears clear to me, in the firſt place, though my crop was great, I certainly need not regard it as equal to the greateſt return that field could produce; for the fibres of Corn, or Barley roots, as far as we can trace, do not extend above ſix inches each way: in that caſe it is evident, that there would remain ſix inches breadth of earth between each row unpervaded with roots, and no ways exhauſted of vegetable pabulum; for which reaſon, I will venture a ſurmiſe that even a crop one third larger, might be attainable on the ſame ground. However, let us drop conjectures, and content ourſelves with experiments and facts, the proper inſtructors for general improvement in rural œconomicks. But to return, Had the Barley been nearer, it would not have continued tillering ſo late; for

ſome

ſome few of the outward later ſhoots had not obtained their full maturity when the crop in general was quite ripe, which makes me judge it right in future to ſow nearer, but on no account ſo as to exclude the operation of the hoe; for on it I place my chief dependance, both as to the immediate, as well as to the ſucceeding crop, being in fact a kind of ſummer fallow, having equally the two advantages, of killing weeds, and changing the ſurface that is alternately expoſed to the atmoſphere, to imbibe its vegetative properties. Immediate ploughing after harveſt, deſtroys every autumn weed; and alſo the turning, under a ſtiff ſtubble, will of courſe keep the land ſo light and porous as to make it imbibe deeply the full effect of winter froſt. I ought not to omit mentioning that this ſaid field was, on the whole fourteen acres, all alike in Turneps; and that the ſix unoccupied by the Barley or Wheat, were

planted

planted at the ſame time in two diſtinct placks with Peas and mazagan Beans: the reſult was, that the Beans being ſown ſo late, made but a poor return, although the hoeing gave ſuch a vigour to their growth, that many ſtalks were eight feet high; and the Peas being ſcattered too thin, notwithſtanding careful hoeing, were ſo foul in the drill, that I had but eight buſhels to the acre; a convincing proof that purſuing the beſt ſyſtem, will not inſure ſucceſs, if improperly managed, which is but too often the fate of many ingenious inventions, and thereby they ſink into oblivion.

Having thus, Sir, imparted to you the few farming ideas my little experience has enabled me to preſume concluſive, I ſhall finiſh by informing you, that I ſhall venture the whole of my autumn and ſpring ſowing, on the plan I have here adopted;

of which I will with pleaſure tranſmit you a minute detail, ſhould ſuch proceeding be regarded as worth inſpection, and lead others to avoid errors, or profit by inſpection. I remain,

DEAR SIR,

With great reſpect and ſincerity,

Your affectionate nephew,

WILLIAM WHITMORE.

*The*

*The Gold Medal was adjudged to Mr.* THOMAS ROBINS, *of Bowldon Farm, in the Pariſh of Laſhborough, near Tetbury, Glouceſterſhire, for the greateſt Quantity, per Acre, of Turnep-rooted Cabbage; from whom the following Account was received, together with a proper Certificate, ſigned by the Reverend* JOHN GREGORY, *Miniſter of Laſhborough.*

SIR,

SEEING in your laſt publication a premium offered for the greateſt weight of Turnep-rooted Cabbage, per acre, and having grown a fine piece myſelf, I was induced to weigh it, which weight is incloſed in the Certificate, and muſt beg to become a claimant; and though it might, in compariſon with the weight of Turneps raiſed per acre, appear but trifling, yet its value, at the time it is made uſe of, is almoſt incredible. Laſt ſpring,

fodder being ſcarce, and the Turneps all eat, I tried the experiment how many ſheep might be kept upon one acre, for a given time; I ſhut up two hundred ewes, with their lambs, into a piece of paſture land, poor in its nature, and in extent ſmall, being not more than ten acres, and fed them regularly, after pulling up the roots and cleanſing them from leaves, dirt, &c. and found that one ton, or twenty hundred weight, was ſufficient to ſerve them one day, and to keep them in all deſirable health. I then gave them one piece more of land to run over, that was planted, the preceeding year, with rye-graſs; and though the feed, from being eat all winter, and late the ſame ſpring, was very trifling, yet by the help of that I made thirteen tons ſerve them eighteen days, and the ewes and lambs at the end of that time were very much improved; which was more than four acres of Tur-

neps

neps would have done in April, the time thoſe were fed.

The ſoil, a ſtone braiſh, inclining to ſand, not worth more than ten ſhillings per acre.

The preparation the ſame as for Turneps; that is, a winter and ſummer fallow, three times ploughed, about twenty put load of compoſt per acre, earth and dung properly mixed the preceding winter. As I have always found this kind of compoſt anſwer much better than dung alone, I take care to be provided with a ſufficient quantity. About the beginning of April, the ſeed is ſown in a clean ſpot of ground, generally upon an old paſture were the ſheepfold has been in the winter after taking away the dung; taking care to have it dug very ſhallow, as the roots of the young plants might ſoon reach the dung or ſalts,

which muſt conſequently be left, in order to force them out of the flies way, as thoſe inſects are amazingly fond of them, more ſo, I believe, than of turneps.

About the middle of June, if the weather will permit, they ſhould be planted out, upon one bout ridges, raiſed by a double plough, made for that purpoſe. Seven thouſand plants are ſufficient for one acre; if only ſix, the roots will be the larger. As ſoon as the weeds riſe, they muſt have a hand-hoeing; after that, I plough a furrow from each ridge, which, after lying a proper time, is with the double plough thrown back, which is all neceſſary for their cultivation. Muſt beg leave to ſubſcribe myſelf with much reſpect and eſteem,

SIR,

Your obliged humble ſervant,

THOMAS ROBINS.

To Mr. MORE.

*The*

*The following Certificate accompanied Mr.* ROBINS's *Claim.*

THIS is to certify that Mr. THOMAS ROBINS, of Bowldon Farm, in the pariſh of Laſhborough, near Tetbury, in the county of Glouceſter, had five Acres of Turnep-rooted Cabbage this year: the average weight, per acre, after the leaves and dirt were taken off, was thirteen tons ten hundred and ſeventy-ſix pounds.

In witneſs whereof we have hereunto ſet our hands, this 25th day of October, 1784.

Signed

J. GREGORY, Curate of Laſhborough.
WM. TUGWELL, Overſeer.
RT. COMELY, Churchwarden.

*The Thanks of the Society were given to Mr.* Ross, *and to Mr.* Small, *for the following Communication, by which the Utility of the Turnep-rooted Cabbage is clearly demonſtrated, particularly for feeding Sheep, even in the moſt northern part of the Iſland of Great Britain, where, from the Severity of the Winters, the Opportunity of obtaining Spring Food for Cattle and Sheep, is an Object of very great Importance.*

*Extract of a Letter from Mr.* John Ross, *Profeſſor of Church Hiſtory, in the College of Aberdeen, to Mr.* Alexander Small, *a Member of this Society.*

Dear Sir,

WE made a fair trial of the Turnep-rooted Cabbage, at Cullen Houſe*, laſt year: they ſucceeded beyond expectation,

* Cullen Houſe is the ſeat of the Earl of Finlater, in Bamf Shire, near the northern extremity of Great Britain.

tation, as you will ſee by the following note from the Overſeer; and there are as many ſeeds of them preſerved this ſeaſon as would ſow a whole county. I intend to ſend a conſiderable quantity to Sir A. RAMSAY, and Mr. BARCLAY, of Ury, together with the two Volumes of the Tranſactions of the Society inſtituted at London for the Encouragement of Arts, Manufactures, and Commerce; in which the directions for cultivating them are contained. I cannot entertain a doubt of their ſupplying the want of ſpring food after the Turneps are exhauſted.

"The ſeeds of the Turnep-rooted Cabbage were ſown about the middle of March, 1784, in garden-ground properly prepared, and the plants were fit for tranſplanting by the middle of June, when they were tranſplanted into a dry light ſoil, well cleaned and dunged, with rotten cow-dung, in rows three feet diſtant

tant from each other, and at the diſtance of twenty inches in the rows.

" They were kept very clean, and the earth was hoed up to the roots of the plants, which perhaps prevented the bark of the roots from becoming ſo hard as otherwiſe it might have been; after all, it was neceſſary to cut the roots in two, before the ſheep could eat them; after they were cut, the ſheep eat them greedily, preferring them to every other ſort of food; and the roots continued perfectly ſound and good, for at leaſt a month, after the common Turneps became unfit for uſe.

" The roots in general weighed from eight to ten pounds; a few of them more."

*The Thanks of the Society were given to Mr.* JOHN WAGSTAFFE, *the Writer of the following Letter, for the uſeful Communication contained therein.*

ESTEEMED FRIEND,

AS I do not preſume to become a claimant for the honourable diſtinction aſſignable by the ſeventy-ninth propoſal of a premium, "For a method of improving ſoils lying waſte or uncultivated;" having had my experience of ſuch improvement, confined to a ſmall compaſs; but yet of ſufficient extent, to enable me to form ſome judgment of the practicability of the improvement of any waſte, when nature has ſpread a vegetable turf, and the converſion of ſuch waſte, under that natural advantage, to a ſucceſſion of arable production; I therefore addreſs thee, without any concealed ſignature, with a ſhort detail of ſuch improvement; my principal object being to point out an early beneficial incloſure, in a mode,

I conceive, not before practiſed, and for a ſupplemental inquiry of thee to follow the cloſe at this addreſs, which will await thy reply.

Reſpecting the land, three acres of which were marſh land, generally under water in the winter, and frequently during the ſummer, and in which were ſeveral ſtagnated hollows of water, the conſtant receptacle of water, ſnails, and other water inſects; the other part more generally covered with ruſhes, and other aquatic plants, that hardly the fourth of the whole extent afforded a paſturage for cattle. As it might be naturally ſuggeſted, I opened drains for the water, and interſected, by open ditches, my three acres, into as many diſtinct pieces. The excavations of the ditches raiſed ſome of the leſſer inequalities, while earth, brought from a neighbouring hill, raiſed the hollows. The plough was now capable

pable of traverſing from ditch to ditch; and the firſt year afforded a good crop of Oats, and another of Turneps, (the ſame ſeaſon); the next year, Barley; and the two ſubſequent ſummers, a two-fold crop of Trefoil and Clover. This laſt year, 1784, I had near half of it dibbled for Wheat, which was allowed to be equal to any in the neighbourhood, and was productive beyond the common average.

The heath land (one acre) was the gratuitous gift of the lord of the manor (Sir Wm. Jerningham). In the ſpring of 1782, which, after cleaning of furze and ling, I ſpread about two load of ſtable dung over its ſurface, broke up the turf, as is accuſtomed in this country, for the planting of Wheat; on which I had Peas dibbled, which produced well. The year 1783 gave me a bounteous crop of Wheat; and even 1784, the ſame Grain, having previouſly ſpread ſeveral

veral load of a loamy clay, obtained beneath its ſurface, over it; with a farther refreſhment of ſtable manure. This crop was little inferior to the former; and the preſent year, without any additional dreſſing or manure, the beſt crop of Barley of the vicinity. I wiſh to apologize for this length of communication, my primary object being the mode of incloſure.

After the ground was marked, I opened at due diſtance, within about two feet (where was to be) of the interior edge of the ditch, holes about eight inches deep, where I planted large cuttings of the black and white Poplars, particularly the former; and upon the opening of the ditch, the turfs pared from the ſurface were piled about fifteen inches in height round the fixed cuttings, intermixed with a ſmall portion of better earth than the native ſoil. The bank now raiſed in the Norfolk mode of incloſing, preſented the cut-

cuttings in the middle, three and four feet in height above its ſurface, which are now from nine to twelve feet in height, with branches extended, I believe, equal in length and girth to their ſtems when firſt planted. I may add, that, in the intervals of theſe promiſing timbers, I planted truncheons of the ſallow, and various other ſpecies of the Willow, which have diffuſed their branches, that, if now lopt, there might be formed from them numerous faggots. I may farther add, that this incloſure is on the acclivity of a hill, a ſituation not friendly to the growth of the poplar ſpecies. I am, with attentive regard to the Society,

Thy reſpectful friend,

*Norwich*, Dec. 11, 1785. J. WAGSTAFFE.

To Mr. MORE.

P. S. I ſhall be glad to be informed whether the Society has received a ſatisfactory diſcovery to the 107th premium of a ſubſtitute for or preparation of Yeaſt. If not, I wiſh, at the Society's own future appointment, to communicate what I have found (as far as I have tried) an effectual ſubſtitute for that fermenting ſubſtance.

IN the Year 1782, the late KEANE FITZ GERALD, Eſq. Vice Preſident of this Society, communicated to the Royal Society, a paper printed in the 72d Vol. of the Philoſophical Tranſactions, page 46. In that paper, Mr. FITZ GERALD gives an account of ſome Hempſeeds, which he had received from the late Mr. ELIOTT, being ſown by his direction, and growing to the height of more than fourteen feet, and nearly ſeven inches in circumference. The plants were pulled up in the beginning of November, and, being ſteeped a fortnight in water, were placed againſt a ſouthern wall to dry. Mr. FITZ GERALD was afterwards agreeably ſurpriſed to find the Hemp could eaſily be ſtripped from the woody part, not only of the ſtem, but of the lateral branches alſo. The produce of Hemp, from thirty-two plants, was three pounds and a quarter. Mr.

FITZ

FITZ GERALD, applied to the Directors of the Eaſt-India Company, to procure ſome of the ſeed from China; and in conſequence of this requeſt, ſome of thoſe ſeeds, together with two other kinds under the name of Flax, were received by the Company, on board the ſhips that arrived in the latter end of the year 1784; and in order that proper experiments might be made therewith, the Directors, in April, 1785, obligingly favoured the Society with ſome of each ſort. Theſe were diſtributed to ſeveral members; but as they were ſown later in the ſeaſon, than perhaps they ought to have been, few of them appear to have ripened their ſeeds.

One of the following letters contains an account from Mr. HOY, gardener to the Duke of Northumberland at Sion; his Grace, whoſe attention to every kind of improvement is too well known to

need being expatiated on, having directed that ſome of each kind ſhould be cultivated in his gardens.

The other letter is from Mr. LAURIE, a gentlemen particularly curious in the culture of exotic Plants. But as another quantity of ſeed is now arrived from China, further experiments will be made therewith, and the reſult of the trials laid before the public in ſome future volume of theſe Tranſactions.

*Sion Houſe*, Dec. 9, 1785.

SIR,

IN a Letter received by Mr. BELL, you wiſhed to be informed of the method I have taken to cultivate the different ſorts of Hemp and Flax ſeed, received from you in April laſt. I tried them three different ways.

Firſt, ſowed ſome of each in a hotbed, where the heat was very ſtrong, on April 14th: N° I. and IV. (which are certainly the ſame) appeared above ground on the 18th; but N° II. and III. not until the 22d. On the 25th, I potted them into ſecond ſize pots, three plants in each, and ſet them under a hotbed frame, where the heat was gone off, to harden them for planting in the natural ground, which I did on the 30th, by turning them whole out of the pots; letting them, three together,

be planted at two feet diſtance every way, covering them at times for about ten days, until they were rooted (or ſhould have been). The Flax, N° III. or *corchorus olitorius* of Linn, died off in a few days; I replaced it ſeveral times, but without effect.

The ſecond ſort of Hemp, *crotolaria juncea* of Linn, got to the height of about three feet and a half, ſtem the ſize of a common wheat ſtraw, and flowered, but did not bring ſeed. The Hemp, N° I and IV. got the height* that you have received ſome; and would have been a deal ſtronger and taller, but were hurt much by the high wind. The male Hemp flowered very well, but the female did not; the froſt came on them, ſo that they brought no ſeed.

Second

* The Plants ſent by Mr. Hoy, were from twelve to fourteen feet in height, and many of them nearly ſeven inches in circumference at the bottom of the ſtems.

Second Trial. April 14th, ſowed ſome of each under glaſs cover, without bottom heat, that they might be hardier. N° I. and IV. were up on the 30th, the others later, in the ſame proportion as before. This ſowing, although much later, the Hemp got quite as ſtrong as the former; the other ſorts as above came to nothing. I potted out ſome of N° II. and III. and kept them in hotbed, and hothouſe. Got the ſecond to flower four feet high; the third, or *Flax*, two feet and half: they both damped off the beginning of November. I had one pot of Hemp in the ſtove, in which were one female, and two males; of them I ſaved a few ſeeds.

Third Trial. April 27th, ſowed all the ſorts, in patches, in the natural ground; ſome of all came up, but the Hemp only came forward. The ſoil being rich, this laſt got as ſtrong as the firſt and ſecond trials, they being on poorer ſoil. I am ſorry

I did not ſow the common Hemp with the others to compare. I think the form of their leaves are nearly alike; the China Hemp is of a paler green. I ſhall try to preſerve them though the winter, but I think by every appearance that they are all but annuals.

I ſhall be happy to give you any farther information that may be required; and am,

SIR,

Your moſt obedient

Humble ſervant,

THOMAS HOY.

Mr. MORE.

SIR

SIR,

AS you was kind enough, ſome time ſince, to favour me with ſome ſeeds, brought, as I underſtood, from the Eaſt Indies, I now take the liberty to tranſmit you an acount of their produce; in order to which, I have incloſed you the ſeveral ſpecimens of each, with their numbers, &c. as delivered to me*.

N° I. Hemp, ſuppoſed by me to differ in no reſpect from the fourth ſort, (Hemp N° IV.) and very little, if at all, from our common manured Hemp.

N° II. Hemp §. I believe there muſt have been a miſtake in the name given to this, as it does not agree with the general



* Thoſe dried Specimens are reſerved in the Society's Collection.

§ Thus theſe ſeeds were marked when ſent to the Society from the Eaſt-India Company.

characters aſcribed to Hemp, which particularly mention digitated or fingered leaves. However, as the Plants have not as yet produced any flowers, or parts of fructification, I cannot refer them to their proper claſs.

N° III. Flax *. This is a ſpecies I do not remember to have ſeen before: it has produced no flowers this ſeaſon, and the leaves (as may be ſeen by the ſpecimen) are now beginning to wither.

N° IV. Hemp. This, as I mentioned above, correſponds exactly with the firſt ſort, both in its ſeeds and plants. It may be neceſſary to add, that the method I took to raiſe the Plants, was by ſowing the ſeeds in pots filled with a loamy ſoil, in the ſpring, and plunging them into a bed made of Tanner's bark: ſome of

* See Mr. Hoy's Letter.

of the Plants appeared in a few days, the reſt ſoon after.

As theſe plants are herbaceous, and will probably produce flowers next ſummer, any remarks I may make (if I am not thought too troubleſome already) will be faithfully tranſmitted you.

I am, SIR,

Your moſt obedient

Humble ſervant,

WILLIAM LAURIE.

Mr. MORE.

*Holloway*, Sept. 1,
1785.

P. S. Any future favours of this kind will be gratefully acknowledged.

*Bartholomew Close*, Dec. 17, 1785.

SIR,

IN conſequence of an advertiſement in this day's Advertiſer, reſpecting the culture of the Chineſe Hemp, I think it may not be improper, at this time, to incloſe you (agreeable to my promiſe) ſome further obſervations upon that ſubject.

Two plants, the one of the Hemp (No. I.) the other of the Hemp (No. IV.) have ſince produced perfect ſeeds, which, as hinted in my former letter, exactly correſpond; and thereby (as well as the appearance of the plants) leave no room to doubt their being of the ſame ſpecies.

The

The ſtems of theſe plants are ſent you herewith, for the inſpection of the gentlemen of the Committee.

It may alſo be neceſſary to add, theſe were tranſplanted from the ſeed pots into the open ground.

The Plants of Hemp (N° II. and Flax, (N° III.) are now decayed to the roots, without producing either ſeeds or flowers.

I am, SIR,

Your obedient humble ſervant,

WILLIAM LAURIE.

*The Gold Medal, being the premium offered for gaining Land from the Sea, not leſs than twenty Acres, on the Coaſt of England or Wales, was adjudged to* Mr. JOHN HARRIOT, *of* Rochford, *from whom the following Letters were received, with proper Certificates ſigned by* BACKHOUSE CARR, Eſq. *one of His Majeſty's Juſtices of the Peace for the County of Eſſex, and many other reſpectable Gentlemen of that County.*

*Rochfort*, Sept. 15, 1785.

SIR,

IN conſequence of the premium offered by the Society for the Encouragement of Arts, Manufactures and Commerce, for gaining Land from the Sea, I take the liberty of laying before them an account of my incloſing one hundred and forty-

two

two acres of land, which was conſtantly overflowed by the ſea flood-tides, about four feet deep on an average.

I hope I may not prove tireſome in the recital, but will endeavour to be as conciſe as my language will allow me, in order to be intelligible.

In May 1781, I purchaſed an iſland, called Ruſhley, ſituate between Great Wakering, in Eſſex, and Foulneſs Iſland, containing two hundred and ſixteen acres of land, which was covered by the ſea every flood-tide, but left dry on the ebb. About the middle of June, I began to incloſe the ſame, by raiſing a bank of earth, thirty feet wide at bottom, ſeven feet high, and four feet wide at top, giving the advantage of the batter or ſlope, full two for one on the outſide; that is, every foot in height, was drawn in two feet; by this means, the violence of the waves is ſo much abated that

that, inſtead of beating, ſhaking, and tearing the banks, which is the caſe with all that I have ſeen, they ſpend their fury in a gentle curl up the ſlope of the bank.

I had from twenty to thirty people conſtantly at work upon this bank, until the following Chriſtmas; at which time I had completed my bank, containing ſix hundred and forty rod in length, twenty-one feet to the rod. The bank running in the circular form of the Iſland, the extreme ends were brought oppoſite each other. A large deep Rill, ſeventy-five feet wide, and twenty feet deep, through which the tide (now confined by the Bank) poured in and out with a fall like that at London Bridge. To get acroſs this Rill, and ſhut the tide out, was to be the ultimatum of all my hopes and fears; and it may be ſuppoſed they were not a little agitated, as the greateſt

part

part of my little property was at ſtake; and the whole neighbourhood, who had deemed it impracticable, were kindly divided into two opinions only, viz. whether I was moſt madman or fool, for attempting it.

On Chriſtmas-day, an attempt was made (with earth only) to cloſe the Breach up, which proved ineffectual; for the next tide carried it all away. My ſpirits raiſed with my difficulties; I immediately determined on another plan, and procured long piles, or rather timber trees, and, when framed ready, drove them (by the help of an engine) into two rows acroſs the Rill, leaving a ſpace of fifteen feet between the rows, and ſix inches between the piles. I then laid a tier of ſtrong girders acroſs, about four feet from the bottom, and another about three feet from the top of piles; the height of the piles, when drove into the ground, being fourteen feet.

When

When this was completed, taking the advantage of the loweſt of the neap tides, I filled this Camm, or Hutch, with earth in one tide; and which, when filled, became one ſtrong compact Body, ſo that no one part could give way, without the whole.

I raiſed the earth juſt high enough to prevent the tide overflowing it; and before the next tide came, I had ſtrengthened the Camm by ſtowing earth on each ſide, and raiſing the top. This I continued doing, until I had extended the foot one hundred feet towards the ſea, and fifty feet withinſide, raiſing the top gradually all the time, until I had attained the ſame height (or rather higher) as the bank, making it ſeven feet wide at top.

By this plan, on the 17th of January, following my Chriſtmas miſcarriage, I effec-

effectually ſhut the tide out from one hundred and forty-two acres of rich arable land, and by the ſame means am enabled to graze the ſeventy-four acres of ſaltings without-ſide the bank. The purchaſe of the Iſland was forty pounds; including which, with my expences of embanking, &c. the whole amount of my gaining the ſaid land from the ſea, was only five hundred and ſeventy pounds: ſince that, it has coſt me about fifty pounds more in raiſing particular parts of the bank that ſettled more than the reſt.

I have likewiſe built a houſe, a barn, and ſtable, on the Iſland, where my looker and family, with two or three labourers, conſtantly reſide.

The land, for the firſt two years, was ſo very poachy and wet, that it was with much difficulty I was able to ſtir any of it; but by perſeverance, I thank God, I

have now one hundred and twenty acres of it, in as good tillage as any Turnep land; ſeventy acres of which is now ſown with Rape ſeed, for a crop next year: the other fifty I mean to ſow next ſpring, ſome with Muſtard ſeed, and ſome with Oats. I find the ſalts are too powerful in the land, as yet, for Wheat; but from what little Rape or Muſtard ſeed I grew this laſt year, I find it ſuits either of them exceeding well; and with the bleſſing of God, I hope next year's crop will not only ſave me from the predictions of many of my neighbours, viz. my ruin, but begin to repay me with intereſt; for ſo confident am I of the richneſs and goodneſs of the ſoil, that (unleſs neceſſity ſhould compel me to it) I would not let it for forty ſhillings per acre; and had I the command of a few of thoſe ſpare thouſands which many gentlemen ſeem at a loſs what to do with, I make no doubt

but,

but, in a few years, I could enlarge his Majeſty's dominions, by an increaſe of rich landed property to individuals.

The accompanying Certificates, I hope, will prove ſatisfactory: if not, I muſt beg the favour of your informing me what more is neceſſary;

And am, SIR,

Your moſt obedient

And very humble ſervant,

JOHN HARRIOT.

To Mr. MORE.

*The Committee of Agriculture, having taken the foregoing Account into their conſideration, directed a Letter to be written to Mr.* HARRIOT, *deſiring him to inform the Committee, whence the Water of the Rill therein mentioned ariſes? what Proviſion is made for the diſcharging any ſuperfluous Water from the Land? and how the Cattle are to be ſupplied with freſh Water? In anſwer to which Queries, the following Letter was received.*

SIR,

I THIS day received your much-eſteemed favour of the twenty-ſecond inſtant, adviſing that the Committee of Agriculture wiſhed to be informed whence the water of the Rill, mentioned in my former account, ariſes? what proviſion is made for diſcharging any ſuperfluous water from the land? and how the cattle

are

are provided with freſh water? To the firſt, I have to obſerve, that, previous to my beginning to embank, the whole Iſland was interſected with ſeveral very irregular large Rills, which, as they communicated with each other, divided the land into ſo many irregular marſhes or fields; yet they had but three inlets or outlets, through which the tide conſtantly ebbed and flowed, covering the whole ſurface of the Iſland long before high water; time, and the continual irritation of ſuch ebbing and flowing, having made thoſe Rills equal to the receiving and diſcharging the tide, ſo faſt as it ebbed or flowed. But long before I could finiſh my Bank, I found it neceſſary to ſtop the two ſmaller inlets, which I eaſily effected whilſt the tide ebbed and flowed ſo gently; but after this, when the tide had but one inlet, and the Bank nearly completed, it formed ſo large a reſervoir, that the tide could neither come in nor

go out faſt enough to keep the water on a level, which of courſe cauſed a great fall both ebb and flood. When I firſt began my Bank or Wall, I did not propoſe ſtopping either of the inlets until the laſt of all; but I ſoon found myſelf obliged to ſtop two of them, in order to prevent the water having a thoroughfare, which began to damage the inſide of my Bank. After they were ſtopped, the water within did no further damage to my Bank, its effect and violence being directed to one point: and when at the laſt I ſhut the tide entirely out, by filling up that only remaining large Rill or Inlet, as deſcribed in my former Letter, there remained no other cauſe for ſuperfluous water, except the draining of the wet land, and what fell from the heavens; for which I had at the beginning prepared and laid a Drain or Gutter, made of Elm, eighteen inches wide, twelve inches deep, and fifty feet

in

in length, with proper lids at each end to let the water in or out at pleaſure: this Gutter lies three feet and a half lower than the ſurface of the earth. And here I beg leave to obſerve a great miſtake that is formed in moſt Gutters that I have ſeen; in general they are made ſquare, or nearly ſo, yet there is no compariſon in the diſcharge of water from a flat Gutter, of the ſame number of ſquare inches with a ſquare Gutter.

I wiſh it were in my power to give the Gentlemen of the Committee a better account of my ſucceſs, in endeavouring to provide good freſh water for my Cattle. It is now two years ſince I made a Pond, twenty-five feet wide, forty feet long, and three feet deep from the ſurface: all the earth that came out I formed into a ſloping Bank, round the Pond, to enlarge the ſurface for catching rain, &c. by which means (and the firſt winter when there was a great fall of ſnow, I ſet my men to caſting of ſnow

into it) I have ſeveral times filled it, and as often have had to empty it; for although it is freſh at firſt, it ſoon gets brackiſh. The bottom is a blueiſh leaden-coloured firm loam, and holds water like a china bowl; yet I am of opinion, it is the oozing of the ſalts from the bottom, that continues to make the water ſo brackiſh, and unfit for uſe, that I am for the moſt part obliged to fetch my water in caſks, except in rainy weather, when the troughs round my buildings ſupply me pretty well. However, I am in ſome hopes that the enſuing winter may waſh away and exhauſt the remaining ſalts, about the ſides and bottom of the Pond: if not, and next year's crop proves as I have every reaſon from preſent appearances to expect it may, I intend being at the expence of firſt claying the bottom and ſides, then lay flat ſquare bricks in terras, and over that a layer of chalk, beat fine, which I ſhould think may prove effectual.

Be

Be pleaſed, Sir, to preſent my beſt reſpects to the Gentlemen of the Committee, and acquaint them my heart exults in the thought that my labour may not be unworthy their notice; and next to their approbation, they cannot give me a more ſenſible pleaſure, than pointing out (by their queſtions, &c.) how I may add my mite of information for public utility, either by perſonal attendance, or in ſuch humble inditing as I am capable of. I am, with great reſpect,

SIR,

Your much obliged and

very humble ſervant,

JOHN HARRIOT.

To Mr. MORE.

*Rochfort*, Nov. 25,
1785.

*On*

*On Mr.* HARRIOT's *receiving information that the Society had adjudged their Gold Medal to him in conſequence of the above Account, he addreſſed the following Letter to the Secretary.*

SIR,

MY moſt ſanguine expectations, when realiſed by ſucceſſive crops, from my new incloſed land, will not afford me a more ſenſible nor laſting pleaſure, than what I received this day from your favour of the 8th inſtant, informing me that the SOCIETY FOR THE ENCOURAGEMENT OF ARTS, MANUFACTURES, AND COMMERCE, have adjudged me their Gold Medal, for gaining one hundred and forty-two acres of land from the ſea on Ruſhley Iſland.

Be pleaſed, Sir, to make my moſt reſpectful acknowledgements to the honourable Members for ſo diſtinguiſhed a mark of their approbation;

approbation: it is a favour which I ſhall ever be proud of, and have only to lament my poverty in expreſſion, in not enabling me to convey in ſuitable language, the pleaſing ſenſations I have received on the occaſion.

My ſincere thanks are moſt juſtly due to yourſelf for ſo flattering an addition to my pleaſure, in your very kind and polite manner of communicating the ſame, and for which I ſhall ever hold myſelf

Your much obliged

and very humble ſervant,

JOHN HARRIOT.

Mr. MORE.

Dec. 15, 1785.

*In*

*In the Third Volume of the Tranſactions, page 99, the Publick are informed that* ARTHUR YOUNG, *Eſq. had communicated to the Society further Experiments on the Uſes of the Howard or cluſtered Potatoe, and that the Account of thoſe Experiments as given by him ſhould make part of a future Volume: That Account is therefore now inſerted, to complete his Obſervations on that Subject ſo far as they have hitherto been laid before the Society. And as the Culture of Potatoes is now acknowledged of the firſt Conſequence, not only for the Table, but alſo for the feeding Hogs, Cattle and Horſes, every Account ſhewing the comparative Excellencies of the different Species of that kind of Root, will be of acknowledged Utility to thoſe Perſons attentive to Improvements in Agriculture.*

CON-

# CONTINUATION

## OF THE

# EXPERIMENTS

## ON THE

# CLUSTERED POTATOE,

## At *BRADFIELD HALL*,

## SUFFOLK.

### EXPERIMENT XI.

### CULTURE, EXPENCES, AND PRODUCE OF TWO ACRES AND A QUARTER, 1780.

UPON my return from Ireland, in 1779, I took into my hands a ſmall farm, (at Michaelmas) the only one out of leaſe;

leaſe; and determining to proſecute the culture of Potatoes, I directed a dunghill I had bought of the tenant, to be ſpread upon two acres and a quarter of Barley ſtubble: this was done the firſt week in March, 1780. The 10th and 11th, ploughed it in, planting at the ſame time the ſets in every other furrow the plough made. Thirty-three buſhels ſet the piece, but we fell rather ſhort in ſeed. Harrowed it fine. The laſt week in April, ſhimmed over the ſurface, cutting the whole about one and a half or two inches deep. May 11th, here and there a Potatoe appeared; the twenty-third, they were all up, and then began to hand-hoe them.

In the night between the 7th and 8th of June, there came ſo hard a froſt, that I found, to my aſtoniſhment, the whole crop turned as black as they were wont to be by ſharp froſts in November or December. I had great apprehenſions of their being

being quite deſtroyed. June 15th, I thought they would ſurvive; and to aſſiſt them, went in with the hoes a ſecond time. Followed with a narrow ſhim. Gave a third hand-hoeing, Auguſt 31, &c. October 27th, began to take them up, carting the tops to the farm-yard for manure, and then ploughing and forking up as deſcribed before; but with this difference, on account of ſowing the land with Wheat: The ſeedſman, having the Seed-wheat ready, followed the plough, and ſtrewed the ſeed upon the land turned over, not into the furrow; then the forks following covered it in raiſing the Potatoes. Produce, eight hundred and ſeventy-ſix buſhels from the two acres and a quarter; or, three hundred and eighty-eight per acre dirty; producing clean, in the winter, three hundred and fifty per acre; in the whole, ſeven hundred and eighty-ſeven.

Early in the winter, I began to make the arrangements neceſſary for the trials to aſcertain

aſcertain their value uſed at home; but ſome Bury gardeners bought the whole crop of me at one ſhilling and ſix-pence a buſhel, to take them away at their own expence; and as I knew by experience that, in a ſituation much more favourable than this, they would not yield more than half that value, I agreed with them: but one of the men failing, put an end to the agreement, which I was not ſorry for, as, very unexpectedly to me, the poor people of all the neighbouring pariſhes came very faſt for them at one ſhilling a buſhel.

The froſt of the 8th of June had deſtroyed all the common Potatoes in the country, ſo that I had no rival; a circumſtance that I hoped would have its effect in bringing the cluſter ſort into uſe among the poor; an object of vaſt conſequence to their welfare. Unfortunately they have in this country generally rejected the uſe of Potatoes; or when they have eaten them, bought only the

the white Kidney, or other expenſive ſorts. The cluſter ſort being called the Hog Potatoe, may prejudice them ſomewhat.

I ſold ſix hundred and eighty buſhels, for thirty-four pounds. I kept ſixty buſhels for ſeed; and forty-ſeven I uſed for hogs, &c. but not with attention enough to aſcertain the value. As there is not an equal profit in this country in home applications, as near London, (pork not ſelling at equal prices) I ſhall ſuppoſe the value here to be ſixpence per buſhel.

Expences per Acre.

| | £. | s. | d. |
|---|---|---|---|
| Manuring - - - | 3 | 5 | 0 |
| One ploughing - - | 0 | 5 | 0 |
| Fifteen buſhels of ſeed at 1s. | 0 | 15 | 0 |
| Planting and cutting - | 0 | 5 | 0 |
| Harrowing - - | 0 | 1 | 0 |
| Shimming with great Shim | 0 | 2 | 3 |
| Firſt hand-hoeing, 5s. ſecond 3s. third 2s. - | 0 | 10 | 0 |
| Shimming - - - | 0 | 0 | 9 |
| Taking up, labour* - | 2 | 12 | 0 |
| Rent 1 0 0 | | | |
| Tithe 0 4 0 | | | |
| Poor rates, &c. 0 5 0 | | | |
| | 1 | 9 | 0 |
| | 9 | 5 | 0 |

Produce per Acre.

| | | | |
|---|---|---|---|
| Whole crop, 38*l.* 3*s.* 6*d.* Proportion per acre - | 16 | 19 | 4 |
| Deduct expences - - | 9 | 5 | 0 |
| Clear profit - - | 6 | 14 | 4 |

The

* The uſe of the horſes in ploughing is charged to the wheat crop; and they at the ſame time carted home the potatoes, having to wait for the men.

The ſoil of the potatoe part of this field, (by name, Twelve Acres) is a dry ſound turnep loam on a good gravel bottom; if any thing, too wet for feeding off in a wet ſeaſon, but on which the turnep culture is profitable. This was the land I wiſhed for to try Potatoes on, expecting great products—yet I was diſappointed; for on a ſoil in Hertfordſhire, three acres of which where not worth one of theſe, I have had greater crops: ſeveral circumſtances might occaſion this difference. Firſt, The froſt of the 8th of June, the ſevereſt ever known at that ſeaſon, for it turned all the walnut-leaves black, and even the *plantago lanceolata* of the meadows, might occaſion a conſiderable diminution of the crop: it certainly retarded the growth near ſix weeks. Secondly, The dung was purchaſed, not made on my own farm, which I have found to create a great difference: the farmers let their cows and other cattle wander at plea-

ſure about their fields, returning at will to the ſtraw yard: the conſequence of this is, their dunghill being nothing more than a heap of rotten ſtraw or ſtubble, with little or no animal manure in it. On the contrary, my practice has always been to confine all cattle whatever cloſely to the yard throughout the winter, which makes the dung of double the value. Thirdly, Notwithſtanding the natural goodneſs of the ſoil, it had been much harraſſed by the repeated cropping of the preceding tenant, whoſe leaſe of fourteen years was juſt expired. Theſe three reaſons may be thought perhaps to explain why the crop was not larger.

But it was conſiderable enough to yield ſuch a profit as no common crop ever affords, and proves very clearly how exceedingly advantageous the culture is.

I have before mentioned that the land was ſown with Wheat at the time of taking up the Potatoes. That crop gave me an idea for the firſt time in my life that Potatoes were rather of an exhauſting tendency: I had always ſteadily conceived them to be very much the contrary.

The workmen, all, while they were taking up this crop, ſaid I ſhould have no Wheat; it would be too rank and laid: but the contrary was the fact; there was no luxuriance in the colour through the latter part of the ſpring, nor at harveſt, which ſpoke its being very well fed; part adjoining, after other preparations without dung, was equal. It is true the poverty of the dung, and the tenant's cropping, would affect this product; ſo that I venture no more than to offer a ſuſpicion that this Potatoe, contrary to a thouſand aſſertions in print, exhauſts very much.

I was not equally able to make this obſervation upon the poor ſoil I occupied in Hertfordſhire, for I never ventured Wheat after them; and though I got very good Barley after, yet the manurings were ſo ample that I could not decide the queſtion, had it been put to me.

## EXPERIMENT XII.

CULTURE, EXPENCES, AND PRODUCE OF FIVE ACRES, 1781. Four acres of this crop (in field called Jermyn) were on a wheat ſtubble very much exhauſted by the tenant, but the ſoil an exceeding good ſandy loam, dry enough for Turneps, yet excellent wheat land. The other acre was part of an old upland meadow (by name, Horſe Cloſe,) which I ploughed up, deſigning it for a new garden; and as a variation

of

of culture, I planted it with Potatoes in the manner of the other crops, every furrow, but without any dung.

Between March the 4th, and the 31ſt, I carted three hundred and ſixty one-horſe cart loads (not three-wheeled, but containing about twenty buſhels) of compoſt farm-yard dung* and earth, on to the four acres; which being ſpread, we began to plant, April the 7th, finiſhing the 11th; one land being ſet with the Red Kidney, and the Iriſh White-eye.

The piece of meadow land was planted the 16th of March. The 9th and 10th of May, very ſharp morning froſts damaged many of thoſe that were up; but not to the degree that happened laſt year. It was the firſt week in May, before I went over the field with the ſhim; and June the 1ſt, I horſe-hoed them with the narrow ſhim.



* Made in the Winter of 1779, 80.

Between the 11th and the 23d of June, hand-hoed them very carefully, raiſing the ſpear graſs (*triticum repens*) with four-pronged forks, where it was found in bunches, and carrying it off the land. The twenty-fifth, ran a double mould-board plough through the rows. July the 7th, &c. hand-hoed them again, and afterwards hand-weeded. The acre of graſs being ſet every furrow, had no horſe-hoeing; and ſo few weeds came up, that one hand-hoeing kept it clean. October the 3d, began to take up, carting the ſtalks to farm-yard; finiſhed the 24th.

In this operation, which hitherto had been the moſt expenſive article of the culture, coſting me laſt year no leſs than £. 2. 12*s.* per acre, and always being a very heavy charge, I made an improvement which, as it anſwered exceedingly well, ſhould not be omitted. In the way hitherto

hitherto practiſed of taking them up, the plough having turned a furrow, the men break it in pieces with forks, for boys, &c. to pick the Potatoes; this being the expenſive part, was what I tried to ſave. I conſtructed an iron ploughing harrow to fix in the holes of my ſhim beam, with two, three, or four teeth (to be uſed according to the tenacity or friability of the land) ſtanding obliquely, ſo that the horſe walking in the path of the furrow, the teeth might be in the direction of the land turned over by the plough. But, upon trial, the labour to keep it in that direction was too great; to remedy which, I added a ſemicircular iron to ſlide againſt the land ſide of the furrow at the bottom of it; and by trying it repeatedly with the ſmith in the field, and going from the furrow into the forge, and from the forge to the furrow, did not leave it until it worked to my mind.

This

This harrow, with one man, one horſe, and no boy to lead, tears the furrow to pieces, and ſcatters it ſo as to lay bare all the Potatoes. It did the work of ten to fifteen men; and if there was any material difference, it was in its favour: not that forks very carefully worked, could not do it better; but when ſo many people are collected, no attention of the maſter will prevent talking, careleſſneſs and idleneſs, occaſioning neglect. The great proof is, the ſucceeding crop of Wheat not having more Potatoes among it than were in that which ſucceeded the forks of the laſt year.

In a word, I had every reaſon to be ſatisfied with the tool. Firſt the plough went, then the boys picked all the Potatoes that appeared; the harrow followed, and the boys picked again.

Produce in the whole, one thouſand eight hundred and eighty-eight buſhels

out

out of the field; clean in the winter, one thouſand ſix hundred and twenty-ſeven.

| | Clean. |
|---|---|
| The four acres of wheat ſtubble produced of the cluſter | 1357 |
| Of the other ſorts | 70 |
| | 1427 |
| Per acre | 356 |

The one acre of lay produced but two hundred buſhels. This was entirely owing to the turf in ploughing being laid too heavy on the ſeed; it could not get through but with difficulty: had they been dibbled in with an iron dibble, I believe the crop would have been much more conſiderable, as the ſoil is a loam on a marly clay, ſtiffer and wetter than thoſe I have already deſcribed. A few rows of common Potatoes, did not get through at all; which ſhews that

that the cluſter has a much ſtronger and more powerful vegetation. I ſhall calculate only the crop of the four acres.

Expences per acre.

| | £. | s. | d. |
|---|---|---|---|
| Manuring, ninety loads of compoſt * | 2 | 13 | 9 |
| Carried over | 2 | 13 | 9 |

One

* The only way I have of calculating what was the actual expence of this manure, is to reckon the price of the ſtubble and ſtraw bought—the cartage and the labour.—To eſtimate it at what I could have ſold it for, would be vague, and lead to no uſeful concluſions.

| | £. | s. | d. |
|---|---|---|---|
| Eleven acres of ſtubble bought of the tenant that left the farm, at (according to his leaſe) 1s. 6d. per acre | 0 | 16 | 6 |
| Chopping and gathering ditto at 1s. 9d. | 0 | 19 | 3 |
| Paid for carting it to the yard | 1 | 10 | 0 |
| Per acre 6s. | 3 | 5 | 9 |
| Carried over | 3 | 5 | 9 |

Four

| | £. | s. | d. |
|---|---|---|---|
| Brought over | 2 | 13 | 9 |
| One ploughing | 0 | 5 | 0 |
| Twelve buſhels of ſeed | 0 | 12 | 0 |
| Cutting at 2d. | 0 | 2 | 0 |
| Planting | 0 | 3 | 6 |
| Shimming ſurface | 0 | 2 | 6 |
| Firſt hand-hoeing | 0 | 6 | 0 |
| Horſe-hoeing | 0 | 6 | 0 |
| Carried over | 4 | 6 | 3 |

Double

| | £. | s. | d. |
|---|---|---|---|
| Brought over | 3 | 5 | 9 |
| Four loads of ſtraw | 3 | 4 | 0 |
| Turning and mixing | 0 | 12 | 0 |
| Filling and ſpreading three hundred and ſixty loads, and driving the carts away twenty days, at 1s. 8d. | 1 | 13 | 4 |
| Two horſes, twenty days, at 2s. | 2 | 0 | 0 |
| | 10 | 15 | 1 |
| Per acre | 2 | 13 | 9 |

The earth made the greater part of the compoſt.

| | £. | s. | d. |
|---|---|---|---|
| Brought over | 4 | 6 | 3 |
| Double mould-board ploughing | 0 | 1 | 2 |
| Second hand-hoeing | 0 | 1 | 8 |
| Hand-weeding | 0 | 1 | 3 |
| Labour, taking up, ploughing, harrowing, picking, carting, and laying up | 0 | 18 | 9 |
| Carting home, &c. at 1s. | 0 | 2 | 6 |
| Expences, horſes, and labour for carrying ſuch of the crop as was ſold at a diſtance; horſes, 2l. 7s. labour, 2l. 6d. in all, 4l. 7s. 6d. Proportion per acre | 0 | 17 | 6 |
| Rent, tithe, and rates | 1 | 15 | 0 |
| | 8 | 4 | 1 |

Produce

Produce.

| Buſh. | £. | s. | d. | each. |
|---|---|---|---|---|
| 1304 cluſter ſold for | 46 | 14 | 1 | or 8d. |
| 93 do. uſed for Hogs | 1 | 11 | 0 | or 4d. |
| 60 do. uſed for Sheep | 0 | 0 | 0 | |
| 190 do. ſaved for ſeed | 5 | 0 | 0 | or 1s. |
| 70 common ſort, ſold or ſaved for ſeed | 7 | 6 | 0 | or 2s. |
| 1627 | 60 | 5 | 1 | |

| | | | |
|---|---|---|---|
| Or, on an average, 8d. $\frac{1}{4}$ each; at which price three hundred and fifty-ſix, the acreable produce, come to | 12 | 19 | 7 |
| Expences | 8 | 4 | 1 |
| Clear profit | £. 4 | 15 | 6 |

OBSER-

## OBSERVATIONS.

IN relation to the value here charged in the application to ſheep and hogs, I muſt inform you that the hogs were fattenning ones;—the Potatoes were boiled and given alone;—and by weighing alive in the manner deſcribed in the preceding experiments, that value was aſcertained: but it is fair to obſerve that, of all the hogs I ever fattened, none throve ſo ill; not owing to the food, for they did as badly when afterwards put to the Barley-meal. I am now got to the country where this event will ariſe until I am fixed in a good breed of ſwine, for there are many hereabouts very bad. As to the ſheep, I muſt beg to be a little more particular.

I had been informed in Ireland, that Wethers had been fattened there to a great

great weight by Potatoes; and having in the winter, preceding this experiment, fattened a parcel of them very ſucceſsfully on carrots, I determined to try them this winter with Potatoes. November the 21ſt, I weighed ſixteen wethers alive; the weight was one thouſand four hundred and thirty-two pounds: incloſed them as I had done thoſe fed on carrots, in a pen on dry graſs, which was moved occaſionally. January the 14th, I weighed them again, as they viſibly fell away: their weight was only one thouſand two hundred and ſixty-four pounds. They had loſt therefore, inſtead of gaining, one hundred and ſixty-eight pounds, having eaten ſixty buſhels of Potatoes. I immediately put an end to an experiment ſo manifeſtly miſchievous, by putting the ſheep to Turneps.

This was the cluſter Potatoe: what they might have done on other ſorts, I do not know, and ſhall not try.

Having laſt year ſuſpected the exhauſting quality of this Potatoe, I obſerved very attentively the reſult in the Wheat that followed this crop. The four acres are part of eight: one was under Turneps fed off forward by ſheep, and three in Peaſe; the whole field ſown with Mr. ARBUTHNOT's red velvet Wheat. Some friends who ſaw the manuring for the Potatoes, ſaid that, if there was not an immenſe crop of Wheat in that part, it would never be gained. The contrary, however, was the caſe; the product in grain was much diminiſhed by the mildew; but that had no effect on the appearance of the luxuriant vigour of a crop while in the blade. The corn ſhewed no ſigns of any uncommon luxuriance; it was better than after the Turneps, and but little: the Peaſe failed, and conſequently the Wheat after them was not great.

I am not yet decided in my opinion upon this queſtion; but I ſtill ſuſpect this Potatoe to exhauſt conſiderably. The friends of the culture ſhould not, however, be alarmed at this; for though it is a deduction from its value, ſtill that value in its product is ſo very conſiderable as to leave it, notwithſtanding this circumſtance, one of the moſt beneficial plants the farmer can put in his ground. The clear profit this year, (4*l.* 15*s.* 6*d.*) after paying manure and all charges, is more than the groſs product of three fourths of the Wheat in this country, no charges at all paid, which is ſuch a difference as to allow no parallel between them.

## EXPERIMENT XIII.

CULTURE, EXPENCES, AND PRODUCE OF ONE ACRE, 1782. The regiſter of this experiment affords two uſeful con-

cluſions, and for that reaſon I ſhall give it; but as it may be ſaid to have failed entirely, I ſhall make it very ſhort. I was ſo convinced of the profit of the cultivation, that I determined to enter more largely on it; accordingly I prepared a compoſt of above nine hundred loads, in order to plant no leſs than eleven acres. The field (by name, Hither Ardera) is of a looſe wet ſandy loam on a clay marle, but laid dry by arched ridges. The death of a relation hurried me ſuddenly to London, at a moſt critical ſeaſon, juſt as I was going to cart the manure for planting. I was obliged to truſt the work to a common labourer in whom I had little confidence. He did it to his time, ploughed and planted the whole field; but the ſeaſon being ſo inceſſantly rainy, he poached it to ſuch a degree, that, on my return, I ſaw at once that all my hopes were blaſted.

There

There was a ſingle acre, over which no manure was ſpread (the compoſt covering but ten acres), that I determined to preſerve, as no carting had been done on it; the reſt I ploughed up for a fallow. That ſingle acre on a poor wet ſoil without dung, and plaiſtered by wet ploughing, I kept clean in the way already deſcribed, and took it up with my new harrow invented laſt year, and which performed as well as before.———This acre, thus ill circumſtanced in almoſt every reſpect, produced, to my wonder, one hundred and eighty buſhels, which were ſold, except what I reſerved for ſeed, at one ſhilling a buſhel, at the barn-door, or nine pounds. The expences, including all charges whatever, four pounds two ſhillings and ſixpence: Clear profit, four pounds ſeventeen ſhillings and ſixpence. It is now ſown with Wheat; and having had no manure, I expect

that crop will fail——but that, time will decide.

The two facts ariſing from this experiment are,

Firſt, That this poor loam will yield a crop of this Potatoe, without manure; of any other ſort, I am clear it would produce none.

Second, That the manure for Potatoes ought to be carted and ſpread upon all ſoils inclinable to wet, before the planting ſeaſon, either in the autumn preceding, or elſe during a hard froſt. I took this hint myſelf, and have now my land for next crop dunged and ploughed in laſt November.

EXPE-

## EXPERIMENT XIV.

CULTURE, EXPENCES, AND PRODUCE OF THREE ACRES AND A HALF, 1783. The ſoil a good turnep land loam, on a ſound gravelly bottom. Manured it from the farm-yard, in November, at the rate of fifty-one horſe loads an acre, each about twenty buſhels, ſpread and ploughed in. Thus I tried a new method of culture. I had always hitherto manured in the ſpring, and ploughed in the dung under a whole furrow. I thought that a ſecond earth at ſowing, would not only pulverize, but mix the manure better with the ſoil, and at the ſame time give the opportunity of planting as early as circumſtances would admit. March 31ſt, harrowed it: April the 1ſt, rolled and harrowed again. The 9th, 10th, and 11th, ploughed and planted it with the

cluſtered Potatoe, except as much as three buſhels of a new Potatoe (the white cluſter) would ſet; the 28th, harrowed the whole.

I ſhould obſerve that the ſeaſon had been remarkably dry; even in the winter we had very little rain. May came in with cold winds and ſharp morning froſts: the 26th, there was ſo ſevere a one, that it deſtroyed the potatoe leaves that were up, and even killed thoſe of many oaks and aſhes. The 27th, there fell twelve hours of rain. Nothing could be more unfortunate than the effect of the froſts, for they prevented hoeing the crop until much too late. The young plants that were juſt peeping out of the ground, were rendered inviſible: waiting for their riſing again, gave time for the weeds to get a head, and made the cleaning this crop more expenſive than any I ever had before. It was the 7th of June, before

I could begin. Shimmed the rows twice July 5th, and earthed them with double mould-board plough. The nineteenth, began to hand-hoe again; which was repeated: the next day earthed up again. The 9th of October, the tops were killed by froſt: the 20th, began to take up in the ſame manner as deſcribed in the two laſt experiments; the harrow anſwering as well as ever. Half ploughed it again acroſs on to two furrow ridges, picking after the plough for the few Potatoes that eſcaped the former tillage. I did this, that the land might be the more expoſed in winter, and lie drier, as I intended Barley and Lucerne to ſucceed.

Product in all, eight hundred buſhels, of which forty-eight were of the white cluſter. Acreable product, two hundred and twenty-four.

Expences

Expences per Acre.

| | £. | s. | d. |
|---|---|---|---|
| Manuring | 2 | 0 | 0 |
| Ploughing twice | 0 | 10 | 0 |
| Harrowing and rolling | 0 | 1 | 3 |
| Planting | 0 | 4 | 3 |
| Fourteen buſhels of ſeed | 0 | 14 | 0 |
| Cutting ditto | 0 | 1 | 8 |
| Firſt hand-hoeing | 0 | 12 | 0 |
| Second ditto | 0 | 6 | 0 |
| Third ditto | 0 | 10 | 0 |
| Four horſe-hoeings | 0 | 5 | 0 |
| Taking up, labour, 18s. uſe of horſes in ditto, and carting home, 4s. | 1 | 2 | 0 |
| Ridging up | 0 | 2 | 6 |
| Rent, tithe and rates | 1 | 8 | 0 |
| | 7 | 16 | 8 |

Produce.

Produce.

| | £. | s. | d. |
|---|---|---|---|
| Two hundred and twenty-four bushels at 9d. | 8 | 8 | 0 |
| Expences | 7 | 16 | 8 |
| Profit | 0 | 11 | 4 |

OBSERVATIONS.

THE value of nine pence per bushel, here carried to account, was deduced from feeding horses with the root, both boiled and raw. I found from several trials, that sixteen bushels of them boiled would last five horses six days, which is rather better than two pecks each, per diem; but given raw, they did not eat so much. The value of any root thus applied, must be ascertained by the saving of

ing of Oats—which is only to be gueſſed at. I do not offer this value of nine-pence, as a perfectly accurate concluſion; but I am inclinable to think it near the matter. The experiment laſted above a month; but it was not long enough, nor under circumſtances ſufficiently various, to permit me to declare that they may be depended on as a food for hard-worked horſes. This muſt be tried further.

I ſhould obſerve that the horſes dunged firmer, while fed with them boiled, than when given raw.—The expence in labour and fuel in waſhing and boiling, is three-pence a buſhel; that is, one penny labour, and near two-pence fuel.

The White cluſter, appears to yield nearly as well as the Red; but they are little better flavoured.

In the ſevere froſt that happened this winter, I loſt more Potatoes than ever I did before,

before, which made me reſolve in future to contrive ſome method of ſtowing them under ground.

The profits of this year's crop, even if I had reckoned what I ſold at one ſhilling a buſhel, was little or nothing. Two circumſtances contributed: Firſt, the ſeaſon in general, which was a dry and burning ſummer, little ſuitable to a plant that never thrives ſo well as in wet years. Second, the ſpring froſt, by interrupting the hoeing, not only raiſed the expences very high, but greatly injured the crop by letting the weeds abound more than they would have done without that cauſe. Theſe untoward circumſtances prevented my reaping any experience from the variation I had made in preparing for them; and thus it is too often in experiments in agriculture. A year is neceſſary to know the effect of any mode or variation of culture: a thouſand accidents or peculiarities of

of ſeaſon, render many repetitions eſſential to the acquiſition of knowledge, which thus ſlowly and difficultly attained ought to be held in much higher eſtimation than the world in general is willing to grant.

In relation to the effect of the plant on the ſucceeding crop, I have to obſerve that I cannot continue the concluſions againſt them which I began before; but I did not ſow Wheat; the crop was Barley. The field is ſix acres; three and a half Potatoes; above two, Beans; and one land, ſummer fallowed: the whole equally dunged, and all ſown with Barley, which was ſo equal in every part of the field, being all a very fine crop, that it was impoſſible to ſay which was beſt. This ſeems to mark Potatoes as a better preparation for ſpring Corn, than for Wheat.

## EXPERIMENT XV.

CULTURE, EXPENCES, AND PRODUCE OF TWELVE ACRES AND A HALF, 1784. The ſoil a cold but friable loam, upon a clay marle bottom, which makes the field wet for want of draining; yielded Oats in 1783. November 1ſt, began to dung it from the farm-yard, part of the compoſt of the preceding winter*. Spread two hundred and ninety-eight loads over eight acres of it; the reſt not manured at all: ploughed the whole immediately, finiſh-

* As this is not a common yard ſyſtem, a word or two is neceſſary to explain it. The yard is firſt ſpread with marle, and then littered; the cattle were confined the whole winter on it: then it is once ſtirred over, and the winter tare crop all conſumed on it in ſoiling. Horſes, cattle and hogs, make much urine while fed with green tares: the compoſt receives the whole, which, with the offal of the food, adds greatly to the richneſs of the heap. When foddering continues late in the ſpring, and winter tares

finiſhing December the 12th. The firſt of May, ploughed it clean; harrowed after the ploughs; and to try a new method of planting, in which the mould would fall in the lighteſt manner poſſible on the ſeed, I ſtruck the land with the common plough into furrows two feet aſunder; and dropping the Potatoe ſets in theſe, at twelve inches apart, covered them by running a pair of harrows up and down the furrows, then rolled and harrowed again. Nothing could work finer, dryer, or in a manner more promiſing for a crop. Planted in this manner one acre and a half with the white cluſter;

tares are forward, there is not time to ſtir over, in which caſe that operation is deferred until ſoiling is over: but if Lucerne is uſed, it laſts ſo long that the turning over muſt not be delayed. Leaving it afterwards untouched until Michaelmas (that is, until the exhaling power of the ſun no longer unites with any ſtrong fermentation) is eſſential; then it is in fine order for carting immediately to the land on to meadow or young clover, or graſs ſeeds, or potatoes, beans, or other ſpring crops.

cluſter; two acres with the champion, a very fine table Potatoe that never curls, and the reſt of the field with the red cluſter.

June the ſecond, &c. cut the ſurface with the great ſhim. It was the ſixteenth, before the rows were up plain enough to horſe-hoe. Shimmed them; the nineteenth, harrowed them acroſs, not damaging them by ſo doing. The 24th, hand-hoed the firſt time. July 21ſt, hand-hoed again, and ſhimmed a ſecond time. The ſeaſon had been for ſome time exceedingly wet, ſo that the weeds grew apace. Hand-hoed again in Auguſt, and earthed up with double mould-board. October 18th, began to take up, and finiſhed November the ſecond. Purſued the ſame method as before, and had every reaſon to be ſatisfied with the ploughing harrow. I found that thirty-five pickers, women, boys and girls, with two or

three men to keep them in order, would keep two ploughs at work, and find full employment for one horſe to draw home the Potatoes.

The crop is now in conſumption; I can therefore only gueſs at the amount. I calculate it between three thouſand and three thouſand five hundred buſhels.

Having ſuffered laſt year by the froſt, I had prepared for this crop holes in the earth. I dug one ſquare, and two oblong, five, ſix, and ſeven feet deep; and a drain acroſs the bottom, from five to nine inches below it; which was filled in the manner of a hollow drain, and by ſinking a ditch very deep, made it impoſſible for any water to remain. Raiſed over the ſquare hole, a very ſtrong roof; hurdled it; and laying a bed of ſtubble, covered it up eighteen inches thick with earth, except the door, which being hung

in

in an angle of about forty degrees, and ſurrounded with plank, could be covered eighteen inches deep with ſand, very expeditiouſly; and thus I conceive the Potatoes will be ſecure from the moſt intenſe froſt known in this climate. One of the other holes I fitted with a door in the ſame manner at one end; and then, to ſave expence, laid trees acroſs, with hurdles, ſtubble and earth: the other I covered only with ſtubble and earth, deſigning to put its contents at once into the ſquare one when empty. The Potatoes which theſe holes would not contain, I packed in houſes.

The White Cluſter did not produce nearly equal to the Red.

The dunged part of the field yielded double the crop of Red Cluſter, to that not dunged.

I ſhall ſuppoſe the value of eight pence a buſhel, as I have yet had no time to aſcertain it; but intend to try them accurately on horſes, hogs, and bullocks.

Expences per Acre, Red Cluſter, dunged.

| | £. | s. | d. |
|---|---|---|---|
| Manure | 2 | 0 | 0 |
| Two ploughings and an half | 0 | 11 | 0 |
| Harrowing and rolling | 0 | 1 | 6 |
| Planting | 0 | 2 | 0 |
| Twelve buſhels of ſeed | 0 | 12 | 0 |
| Cutting | 0 | 1 | 6 |
| Shimming ſurface | 0 | 2 | 6 |
| Three hand-hoeings | 0 | 11 | 0 |
| Three horſe-hoeings | 0 | 3 | 4 |
| Taking up, including two ploughings, labour only, 17s. horſes in ditto and carting, 7s. 6d. | 1 | 4 | 6 |
| Carried over | 5 | 9 | 4 |

Rent

| | £. | s. | d. |
|---|---|---|---|
| Brought over | 5 | 9 | 4 |
| Rent, tithe, and rates | 0 | 17 | 0 |
| | 6 | 6 | 4 |

Produce.

| | £. | s. | d. |
|---|---|---|---|
| * Two hundred and fifty bushels at 8d. | 8 | 6 | 8 |
| Expences | 6 | 6 | 4 |
| Profit | £. 2 | 0 | 4 |

OBSERVATIONS.

I committed one error in this crop, which was very great, cutting the sets



* I am stating the produce low enough to avoid the hazard of exaggeration; for I have reason to think the crop will turn out more than this.

in a hurrying ſeaſon when every hand was employed. I truſted an old fellow and two women with it, whoſe ſight was either bad, or their careleſsneſs great; for the plants came up very irregularly, with many gaps; ſo that I am perſuaded I ſuffered in the whole field, to the amount of from five to eight hundred buſhels, and perhaps more.

The product was very ſmall, yet the plants throve throughout the ſeaſon perfectly to my ſatisfaction; and at taking up, the Potatoes, even where there was no dung, were large and very well grown; a ſure proof, with ſuch a produce, that the land was under-ſeeded.

Here, Gentlemen, conclude my experiments on this Plant. From the firſt Potatoe that was put into my hands in the year 1770, to this day, I have never loſt ſight of the culture; but whenever I was not prevented

prevented by journies to another kingdom, cultivated it aſſiduouſly. My ſituation in life does not permit me to embark very greatly in any object that will not promiſe ſome reimburſement for expences. There are points yet undecided, particularly the value of it in divers applications, which I long much to aſcertain, but the expence is beyond my forces. I ſhall do it, but it will be by ſlow and gradual ſteps: a winter will rarely permit me more than one or two good experiments in that enquiry. I purpoſe trying them further on horſes and hogs; alſo in fattening bullocks: but I have had ill ſucceſs with fat ſheep *; I ſhall therefore do the reſt cautiouſly.

A general obſervation reſults from all theſe experiments, which is highly ſatiſ-

 factory

* They had had the ſummer's graſs, and were ready (half fat) for Turneps: in that ſituation, experienced graziers know the conſequence of a conſiderable check. It would be the ſame, ſhould they fail with bullocks.

factory——that with ſmall crops, and at the low rate of value which is produced by conſuming the Potatoes at home, they are clearly proved to be a crop which will pay the expence of manuring, and very ample tillage and hoeing. This is, after all, the chief object of modern huſbandry—for if a man can rely upon this Potatoe, for the winter conſumption of his yard, in fattening or keeping hogs, in feeding his horſes, and fattening his bullocks, he has made one of the greateſt acquiſitions that can be deſired, ſince he can do all this upon land much too ſtiff and wet for Turneps; houſes his crops before the winter rains come on, and conſequently without doing any of that injury to his land which the turnep culture is known to intail, and from which even cabbages are not free; effecting this by means of a root which is probably, of all others, liable to the feweſt failures. Thoſe who know the importance

of

of winter food on a turnep farm, cannot but admit the magnitude of this object on wet ſoils.

But upon the dryeſt, it is not without a great value.——Turneps dunged for are univerſally a loſing crop; for if they are ſtated at from thirty to forty ſhillings an acre, their value does not amount to the dung alone which is ſpread for Potatoes: yet the latter root pays that dung, all other expences, and leaves a profit ſometimes conſiderable. I admit that Turneps fed upon the land will prepare better for corn; but that is by no means the queſtion. Would not the dung raiſed in the farm-yard by the conſumption of the Potatoes, ſuppoſing it ſpread upon the potatoe acre, make that produce more than the turnep one? I have no doubt but it would give a ſuperiority.

But

But Turneps are liable to great failures, and cannot be relied on late in the ſpring —Potatoes may; and are applicable to uſes to which the other root cannot be applied.

Upon the whole, Gentlemen, I am clearly of opinion, that you never made a more valuable preſent to the world, than by recommending this Potatoe, which is one of the moſt important articles that can at preſent be cultivated upon any farm.

I am

Your obliged and devoted ſervant,

ARTHUR YOUNG.

To the Society for Encouragement of Arts, &c.

*Bradfield Hall,*
Nov. 9, 1784.

# PAPER

IN

# CHEMISTRY.

THE

FOLLOWING

# ESSAY

ON

# PORTABLE FURNACES,

IS RESPECTFULLY PRESENTED

TO THE

# SOCIETY

BY THEIR

# SECRETARY.

# AN ESSAY

## ON

# PORTABLE FURNACES.

THE well-known advantages that have accrued to experimental philoſophy, and to the Arts, particularly thoſe that depend on chemical proceſſes, from the uſe of portable Furnaces, render it unneceſſary to ſay any thing in commendation of the invention; but as by them gentlemen of rank and fortune, (from whom experiments are chiefly to be expected) are enabled further to proſecute thoſe ſtudies which have already been

been the origin of many of the benefits the publick reap from the preſent improved ſtate of our manufactures, it may not be unprofitable to give a ſhort account of the invention, deſcribe the ſeveral kinds moſt in uſe, and, as all hitherto contrived have laboured under ſome objections, to ſhew a cheap and eaſy method, confirmed by conſiderable experience, by which thoſe defects are remedied, and the uſe of ſuch furnaces rendered more agreeable and commodious.

It is not in this paper intended to deſcribe the ſeveral forms, which ſometimes the judgment, and ſometimes the caprice of the maker, have adopted; but to ſhew that the materials of which they have been conſtructed, though fit for the purpoſe intended, have nevertheleſs been hardly ever properly applied; and then lay before the reader, the method alluded to above, of obviating the objections hitherto made to them.

To

To the celebrated JOHN JOACHIM BECHER, we owe the invention of Portable Furnaces, contrived for performing the different kinds of chemical proceſſes, of which he has given us a full hiſtory and explanation, with many plates, in his work entitled, *Scyphus Becherianus*. In the Introduction to that work, the author ſays, That having obſerved ſome workmen melt iron in a ſmall furnace, it occured to him that ſomething might be contrived by which the ſeveral chemical proceſſes might be conveniently perfomed; and that having completed his ideas on this head, ſome of the firſt furnaces made, were purchaſed by Dr. Dickenſon, phyſician to the King, Prince Rupert, and the Honourable Mr. Boyle.

He directs the furnace to be made of plate iron, having rivets, faſtened at different places, with heads projecting ſufficiently withinſide the furnace. As the

furnace was to be (to the thickneſs of one inch and half) lined with a lute compoſed of clay and ſand; theſe rivets were intended to prevent its cracking, and falling from the ſides.

The uſe of ſuch a contrivance as this, appeared ſo commodious to the late Dr. Shaw, and Mr. Hawkſbee, (to whom the preſent taſte for chemical experiments, is in a great degree owing) that, in the year 1731, they publiſhed, with conſiderable additions to Becher's tract, a ſmall volume entitled, "An Eſſay for introducing a portable Laboratory," for which, as they ingenuouſly acknowledge, they were almoſt wholly indebted to Becher. The furnace deſcribed by Dr. Shaw and Mr. Hawkſbee, differs little from that of Becher, and, like it, is intended to be lined with a lute, which is to be ſecured to the iron plate by means of rivets.

This

This has been hitherto almoſt the univerſal practice in forming portable furnaces for chemical experiments; and it is but juſtice to ſay, that to theſe authors are to be aſcribed the invention and introduction of furnaces on this conſtruction, however the ſhapes may have been varied ſince their time.

Another kind of portable furnaces, if they may be ſaid to deſerve the title, were contrived by Johanne Franciſco Vigani, and the deſcription of them, with figures, publiſhed by him in a ſmall treatiſe entitled, *Medulla Chymiæ*, printed in London, 1683, and dedicated to three Engliſh Noblemen.

As theſe furnaces conſiſted ſolely in having a number of bricks ſo fitted together and marked, that they might eaſily be taken aſunder, when an operation was finiſhed, and commodiouſly ſet

aſide until they ſhould be again wanted: the frequent miſlaying, or loſs of the looſe bricks, ſoon brought this kind of furnace into diſuſe, in experimental laboratories; though it muſt be owned, it has in many caſes ſome advantages, and is often uſed, to this day, by plumbers and other workmen.

About the year 1750, the late Dr. Lewis, whoſe name and memory will ever be reſpected by all votaries to Chemiſtry, obſerving the inconveniencies that attended the uſe of both the foregoing kinds of furnaces, and taking the hint, as he candidly acknowledges, from an ingenious workman, and alſo reflecting on the durability of Black Lead Crucibles, and the eaſe with which the openings for doors, chimneys, &c. are made in them, contrived thoſe portable furnaces, ſo accurately and ſo properly deſcribed by him, in the firſt part of his excel-

excellent work, entitled *The Philoſophical Commerce of Arts*:—a work which if he had met with due encouragement to proſecute, and had completed according to his ideas on the ſubject, would have done infinite honour to himſelf and to his country. Since that time, it does not appear that any one has made an eſſential alteration in the conſtruction of theſe kinds of inſtruments, except the ingenious Meſſrs. Ruhl and Hempel, of Cheyne Row, Chelſea, who having, under the patronage of the Society, eſtabliſhed a manufactory of Black-Lead Pots, and profiting by the thoughts of Dr. Lewis, have employed themſelves in making furnaces, in a very neat and commodious manner, of the ſame materials their pots are formed of; and the only objection to them, is the price at which they muſt neceſſarily be ſold on account of the value of the materials, and the workmanſhip; in every other reſpect, they anſwer well the purpoſes they

are intended for, being ingeniouſly contrived, and executed in a workman-like manner.

It would be highly improper here to omit obſerving that the juſtly-admired Boerhaave mentions two kinds of portable furnaces contrived by himſelf, the one formed of wood, lined with iron plate, in which only thoſe operations that require a very gentle heat, hardly exceeding that of boiling water, could be performed. As, in this furnace, a ſmall equable fire may conveniently be kept up without much trouble or expence, he calls it *Furnus ſtudioſorum*. His other furnace he directs, like thoſe of Becher, to be made of plate iron, but lined with brick ſet in mortar made of lime and ſand: this furnace, however, as deſcribed by him, ſeems too large for experiments; and in ſtrong heats, every one knows how improper it is to have lime come in contact with the bricks,

bricks, which are liable to be greatly injured by it: and indeed neither of theſe furnaces have theſe many years paſt been much uſed.

The celebrated Pott, in his treatiſe, entitled *Lithogeognoſia*, alſo deſcribes a portable furnace, of which a deſign is annexed to his work: in this furnace, he ſays, every thing in nature, that is fuſible, may be melted in an hour or two. He acknowledges this furnace to be very ſimilar to that of Becher, and deſcribes the lute he lined it with, as compoſed of equal parts of pipe clay, burnt and unburnt, mixed together and moiſtened to the conſiſtence of paſte, with bullocks blood. It is evident this will be ſubject to all the inconveniencies of the other furnaces lined with lute.

The principal objection that has ariſen againſt the furnaces of Becher and Shaw, is that the lute, being a mixture of ſand, clay, and water, muſt neceſſarily ſhrink, and conſequently crack in drying: but this evil may in ſome degree be remedied by filling up the cracks, when dry, but before a fire is lighted, with freſh lute, which will, if artfully managed, adhere pretty well to the firſt layer; but there ſtill remains an inſuperable obſtacle, which is, the iron rivets that paſs through the ſides of the furnace, into the lute, expanding in great heats, and contracting with cold, in a degree very different from that of the mixture of clay and ſand that ſurrounds them, they are continually cracking the lute, and ſerve rather to ſeparate and throw it off from the iron plate, than to retain and fix it.

The chief objection to the Black Lead Furnaces of Dr. Lewis, is the thinneſs of

of the crucibles of which they are formed; this not only permits a large proportion of heat to eſcape, but, when the furnace grows red hot, tends very much to incommode the operator, and heat the room wherein any experiments are making.

It is with a view to remedy theſe inconveniencies, rather than to propoſe any new form of a furnace, that this paper is ſubmitted to the conſideration of the Society; and this end is obtained by uniting, in ſome degree, the three above-mentioned contrivances, by adopting the iron of the furnace of Becher, the bricks of Vigani, and the ſize of Dr. Lewis, which ſeems beſt adapted to experimental enquiries.

To form the body of the furnace, which is the only part intended to be here deſcribed (as any perſon converſant with

with theſe machines will readily faſhion the dome and other parts as may beſt ſuit their intention); procure a Cylinder, about eleven inches in diameter, and twelve or fourteen in length, made of ſtrong plate iron, rivetted together; or, as the thickneſs of the lining will prevent its ever becoming hot enough to melt hard ſolder, it will be much neater, if the joint be brazed. At one end, which is to be conſidered as the bottom of the cylinder, a piece muſt be cut out, about four inches ſquare, which is to be the opening to the aſh hole; to this an iron door is to be fitted; juſt above this opening, three iron pins, projecting half an inch or more withinſide the cylinder, muſt be well rivetted on, at equal diſtances from each other: four or five inches above theſe pins, let another hole be cut in the iron cylinder, and a door fitted to it; this ſerves for putting in the fuel, when the furnace is uſed for diſtilling,

and

and ſuch operations as require only a gentle heat.

On the pins before mentioned, lay an iron grate; and let the whole of the cylinder, above this grate, be lined with fire bricks, the joints well fitted, and laid in loam: by this means, the objection to the lute of Becher and Shaw, is obviated; and as the bricks may be left an inch and half or more in thickneſs, the heat will be better retained than in the black-lead furnaces of Dr. Lewis. To ſecure the iron door, whenever the furnace is to be uſed as a wind hole, or any ſtrong fire raiſed therein, a piece of fire brick is to be fitted to the opening, and the door ſhut, which will effectually preſerve the iron from injury.

It has been cuſtomary to make portable furnaces in the form of a truncated cone, the ſmaller end being the lower part

part, that different-fixed grates may fit at different heights: if this ſhape is ſtill thought eligible, it may be eaſily obtained, by leaving thoſe bricks that are next the grate, thicker than thoſe towards the upper part; and the diminution may either be regular, or projections left at the heights required, on which the different grates may reſt.

Fire bricks, fit for this purpoſe, are eaſily obtained in every part of this kingdom; and in London, they are conſtantly to be met with, at a low price, being ſent hither of two kinds, under the names of Windſor Bricks, and Nonſuch Bricks; the firſt ſo called from being brought from the town of that name, and the other from their being made at Nonſuch Park, near Epſom, Surrey. Theſe bricks ſtand every degree of fire well, and are of ſo ſoft a texture, as readily to admit of cutting and grinding into any form required, ſo as to be eaſily adapted

to

to the figure of the furnace. And as the loam or earth of which they are made, is alſo brought to town for ſetting them, that alſo may be readily obtained; and thus ſmall portable furnaces, more durable, and better adapted to the making chemical experiments, than any I have hitherto met with, are eaſily and at little expence conſtructed.

The very reſpectable authors I have already quoted, have given ſuch preciſe and accurate deſcriptions of the forms beſt adapted to the uſes intended, that no additions need be made to their works on that head; and the well-known furnace of Dr. Black, of Edinburgh, when lined with brick, as now recommended, will be found greatly to exceed in utility thoſe which, having been hitherto lined with lute, have been liable to the objections ſtated above.

PAPERS

# PAPERS

IN

# POLITE ARTS.

# POLITE ARTS.

*In the Year* 1770, *Mr.* THOMAS GRENVILLE, *the Inventor of the Machine for teaching Blind Perſons Arithmetic, deſcribed in the following Pages, attended, and worked ſeveral Sums in Addition, Multiplication, and Diviſion; and the Society, conſidering the Contrivance as new, ſimple in its Conſtruction, very ingenious, and likely to prove of great Utility to Perſons labouring under the Misfortune of being Blind, voted Mr.* GRENVILLE *a Bounty of Fifteen Guineas, on Condition he left with the Society a complete Machine*

*and Deſcription of it. This Machine remained in the Repoſitory, and had been conſtantly and uniformly admired by all who examined it, to the Year* 1785, *when the Society received another Letter from Mr.* GRENVILLE, *informing them he had made a further Improvement in his Machine; which having been duly examined, the Society voted him their Silver Medal, and purchaſed one of his laſt improved Machines, which is reſerved in their Repoſitory, and of which a Deſcription and Plate is annexed, with an hiſtorical Account of the Invention, communicated by Mr.* GRENVILLE.

*As a Confirmation of the Utility of this Machine, to Blind Perſons, it may not be improper to inſert the following Letter, addreſſed to* JONAS HANWAY, *Eſq. by Mr.* STANLEY.

SIR,

SIR,

THOMAS GRENVILLE brought his numerical table to ſhew me, when he was in town, and left it at my houſe ſome days for me to examine; which I did, and found I was able, in a quarter of an hour, to multiply or ſubſtract any ſum by it. I do aſſure you, I think it a moſt ingenious contrivance, and ſhall be very glad if my opinion of it will be of any ſervice to the young man, as his ingenuity certainly merits encouragement.

I am, SIR,

Your moſt humble ſervant,

JOHN STANLEY.

*Hatton Garden,*
April 24, 1770.

MY LORDS AND GENTLEMEN,

I HAVE by my long ſtudy, though unhappily without my ſight, completed a Machine, by which any blind perſon may be taught the rules of Arithmetic, viz. Addition, Subſtraction, Multiplication, Diviſion, Reduction, and the Rule of Three; all which I have already proved to the entire ſatisfaction of thoſe to whom I have communicated this work. It may be done in money, weights, and meaſures of all kinds, as perfectly as by thoſe who ſee their work on paper.

I need not urge, that this will be a great amuſement to blind people, but I apprehend it may be of real uſe. I have brought this Machine to town, and will produce it to you, if you think proper, whenever it ſhall be agreeable to you; and I humbly hope, my Lords and Gentlemen, if you ſhould find

it

it anſwer the ends propoſed, you, who are the moſt diſtinguiſhed encouragers of ingenuity, will think me deſerving of ſome mark of your approbation.

It may be neceſſary to inform you that I was reared and bred up in the Foundling Hoſpital, and am now Organiſt of Roſs, in Herefordſhire, and with great reſpect,

My LORDS and GENTLEMEN,

Your moſt humble ſervant,

THOMAS GRENVILLE.

*Covent Garden,*
March 23, 1770.

To the Society for Encouragement of Arts, &c.

*Devonſhire Street*, March 22, 1785.

SIR,

I APPREHEND it will be ſatisfactory to the Society for the Encouragement of Arts, Manufactures, and Commerce, to be acquainted with what gave me the firſt hopes of being able to work queſtions by a palpable Machine, and my progreſſive improvements thereon. I here take the liberty to ſend the inſtrument I firſt made uſe of to accompliſh that end, which, with the hint, was given me by Mr. Thomas, Poſt-Maſter, at Roſs, in Herefordſhire, the deſcription of which is as follows, viz.——

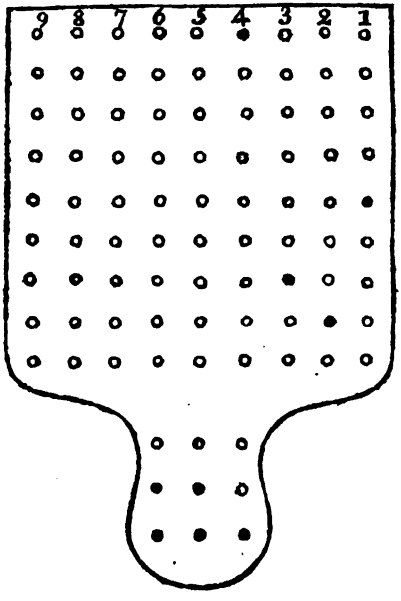
The board has nine perpendicular rows of perforations, (as numbered, 1, 2, 3, &c.

&c.) which repreſents the value of numbers decimally multiplied, as if written upon paper, beginning at the right hand, and reckoning towards the left, as units, tens, hundreds, &c. The tranſverſe rows of perforations, expreſs only the value of the nine digits, as 1, 2, 3, &c. beginning at the top or broadeſt end of the board, and reckoning downward towards the handle for 9. The holes in the handle, are only to place the pegs in, when not employed.

To explain the method of expreſſing a number thereon, I ſhall ſuppoſe that the date of the year is required, which would be performed in the following manner: a peg ſtuck into the firſt hole of the fourth row, repreſents one thouſand; another peg in the ſeventh hole of the third row, repreſents ſeven hundred; another peg in the eighth hole of the ſecond row, repreſents eighty; and the laſt peg in the fifth

hole of the firſt row, is five; which, taken together, is 1785, as ſhewn in Figure I. where the holes in which the pegs are placed are repreſented as filled up with ink like a black dot.

Figure I.

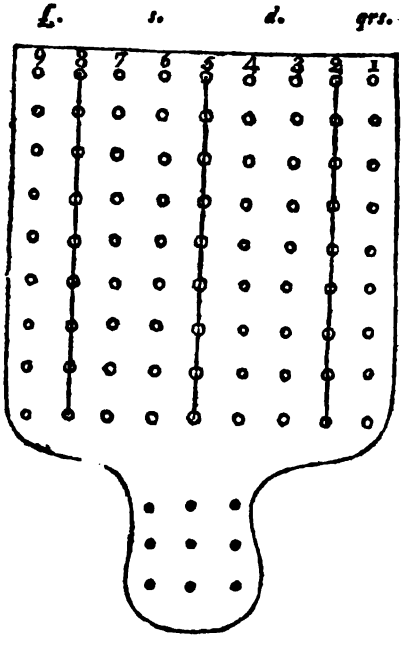



This method of expreſſing numbers, gave me at firſt great pleaſure; but as the

the places in which the pegs were put, and not the pegs themſelves, repreſented figures, my operations were confined to one number at a time only, which cauſed me ſoon to grow tired of it; when a thought ſuggeſted itſelf, that if I could make pegs to repreſent the ten digits, by attaching ſome diſtinction to them, I ſhould be able to work many little queſtions, even upon that narrow ſcale; and upon trial, found it ſucceed to my wiſh. But when I had occaſion to work any queſtion of various denominations, (as of pounds, ſhillings, pence, and farthings) I was obliged to make uſe of three braſs wires to divide the ſeveral ſums, which being ſtuck into three rows of the perforations, left me but one row of them for pounds; as for example: ſee Fig. II. So that I could not expreſs a larger ſum than 9l. 19s. 11d. $\frac{3}{4}$qrs. In order to recover the three rows thus loſt, I contrived to have ſmaller holes pierced between

between the other rows of perforations, to place my ſeparating wires in; by which means I could expreſs any ſum to the amount of 9999l. 19s. 11d. ¾qrs.

Figure II.




I had afterwards an inſtrument made, perforated in twelve rows, and as many ſmaller

ſmaller between them, to fix my diviſion lines in, which enabled me to work much larger, and more complicated queſtions, than I had before; and at laſt, I had another made with eighteen holes each way, and ſmaller between them (as before), together with the apparatus for containing the figures and diviſion lines, which was the machine I had the honour of preſenting to the Society ſome years ſince, and which at that time I thought very complete.

But upon reflection I conſidered that, though my Machine upon ſuch an enlarged ſcale was of great utility to me, it could afford but little ſatisfaction to thoſe who had the uſe of ſight, becauſe they, not being acquainted with my marks, could not judge whether a queſtion was performed right, unleſs they worked it themſelves; wherefore I have, in my laſt improvement, endeavoured to make my operation of a queſtion, as plain to every perſon's comprehenſion, as to myſelf,

ſelf, by impreſſing figures on the heads of my pegs, and adding new marks for my own uſe, which are as follows, viz.

The digit 1, is known to me by a pin's point, placed in the head of the peg on the right hand: 2. is known by the ſame mark in the middle of the head; and 3, by the ſame on the left hand: 4, is the head of a pin on the right hand: 5, is the ſame in the middle; and 6, on the left hand: 7, is a ſmall ſtaple on the right hand; 8, the ſame in the middle; and 9, upon the left hand.—A cypher is repreſented without any additional mark than the bare peg itſelf to make it known.

The Machine, in its preſent ſtate, gives me great pleaſure, becauſe any queſtion, when performed therewith, is now as demonſtrable to thoſe that have the uſe of ſight, as if laid before them upon paper. The inſtrument thus complete, beſides the utility it may be of

of to ſuch as are deprived of their ſight, may perhaps be thought of ſervice in teaching arithmetic to young children as an amuſement, by playing them into the knowledge and value of figures.

If my laſt improvement ſhould meet with the approbation of the gentlemen of the Society, it will be eſteemed a great honour, and give infinite ſatisfaction to, SIR,

Their and your moſt obedient

and obliged humble ſervant,

T. GRENVILLE.

Mr. MORE.

*Deſcrip-*

*Deſcription of a* MACHINE *to teach Blind Perſons the Rules of Arithmetic, in the Repoſitory of the Society for the Encouragement of Arts,* &c.

IT conſiſts of a Box nineteen inches ſquare in the clear within, and near two inches deep, divided into cells, containing the figures, lines, &c. hereafter deſcribed, neceſſary for performing the rules of arithmetic. The lid or cover of the Box, which ſerves as a leaf or ſlate, is pierced full of holes in parallel rows: the firſt row has eighteen large, and ſeventeen ſmall holes, alternately placed; the ſecond row, eighteen ſmall holes, placed under the above large ones; the third, as the firſt, and ſo on alternately thirty-five rows; the whole cover being full, and containing three hundred and twenty-four large holes, and ſix hundred

hundred and twelve ſmall ones, which make an exact ſquare.—The figures are repreſented by pegs with cubical heads, and diſtinguiſhed by pins placed on one ſide in the following manner. One is expreſſed by a pin's point on the right hand; two, by the ſame in the middle; and three, by having it on the left hand; four, five and ſix, by pins heads in the above three different ſituations; ſeven, eight, and nine, by crooked pins or ſtaples, in the ſame manner—the cypher is underſtood by a plain peg without any mark.—On the top of each peg is printed the figure which it repreſents, to render the work intelligible to any perſon that may ſee it without being acquainted with the marks. Theſe pegs were made to fit the large holes.—Pieces of braſs wire, bent to a right angle, about half an inch from each end, and made to fit the ſmall holes, ſerve for the purpoſe of lines to ſeparate the different parts of the work.

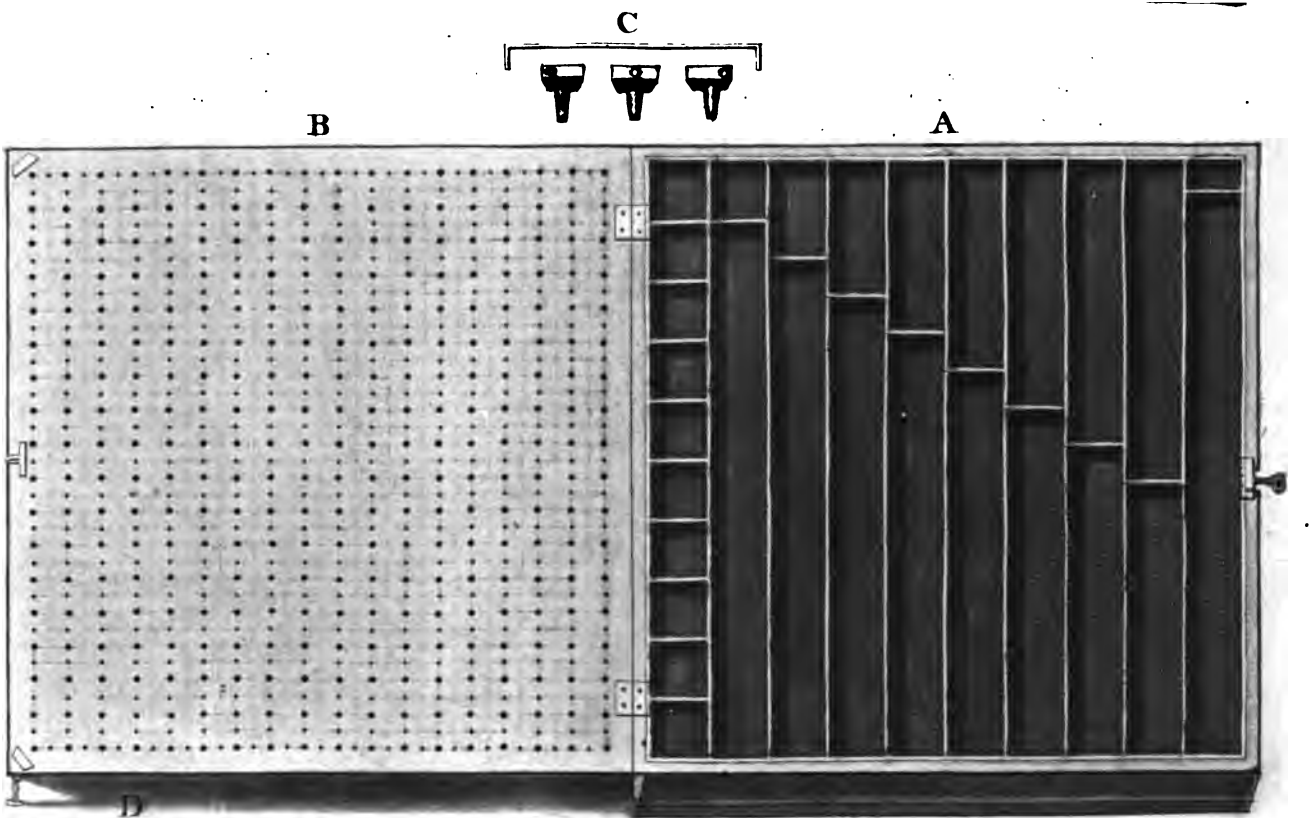
The

The Box contains twenty-eight partitions, ſituated as in the incloſed plan, ten of them to hold figures, and the others for the lines of different lengths.

*Deſcription of the* PLATE *of Mr.* GRENVILLE'*s Machine.*

A. The Box, with its ſeveral diviſions, containing the different pegs, bars, &c. with which the rules in arithmetic are to be performed.—B. The Cover, which, when turned back and ſtanding on its feet as repreſented, ſhews the holes wherein the pegs and bars are occaſionally placed to ſhew the value of the figures.—C. The pegs, marked in ſuch manner as to enable the blind perſon to diſtinguiſh by the touch, what each peg is intended to repreſent when placed in the holes in the Cover B.

PAPERS




*Mr Grenville's Machine for teaching blind Persons Arithmetic.*

# PAPERS

IN

# MANUFACTURES.

# MANUFACTURES.

February 1, 1785, *The Silver Medal was voted to* Miss Henrietta Rhodes, *of* Cann Hall, *near* Bridgnorth, *for her ſedulous Attention to and judicious Obſervations on the breeding and treating* Silk-worms, *as communicated in the firſt of the following Letters; and the Thanks of the Society were given to her for her ſecond Letter on the ſame ſubject, in which is contained an Account of the Succeſs of her Experiments during the following Summer.*

SIR,

IN addreſſing this letter to you with the incloſed hank of ſilk, I believe I deviate from the mode which your inſti-

tution preſcribes, to thoſe who become claimants for the honorary rewards which are ſo nobly diſtributed to genius and induſtry; but my attemps have fallen ſo ſhort of what is required by the Society, that I dare not appear before them under any of thoſe forms which would indicate my pretenſions to be unequivocal. Such however is the idea I have formed of their liberal propenſity to patronize the efforts of perſevering ingenuity and laudable ambition, that if I ſhall be found to have ſucceeded better than any one elſe; if the ſpecimen of ſilk I produce, is (and I have been ſo told by many good judges) ſuperior to any that has yet been manufactured in England, and equal to that which comes from Italy; and if I can prove that it is impoſſible for ſo large a quantity as five pounds to be procured in one year, until plantations of Mulberry-trees have actually been made; I flatter

flatter myſelf that I ſhall not remain undiſtinguiſhed.

I will begin from the period in which I firſt took to feed Silk-worms, as it will ſerve to ſhew their prodigious and rapid increaſe. In the ſummer of the year 1782, a dozen and half of Silk-worms were ſent me by a friend who reſided at a diſtance: I was then totally ignorant of the method of treating them; but I preſerved them in health, and they produced me a great number of eggs.

In the May following, (1783,) I found my ſtock increaſed to about thirteen hundred, and I was ſo fortunate as to loſe very few during the whole time of feeding; for I had twelve hundred and ſeventy very fine Cones, and they produced me near four ounces of ſilk. I preſerved all the eggs from theſe; and on the 12th of laſt May, placed them in

the ſun: they were hatched in incredible numbers; and, by the moſt accurate calculation, I was miſtreſs of more than ten thouſand. I fed them with Lettuce leaves, for the firſt week, and then from three or four Mulberry-trees, which grew in ſome adjacent gardens. However, as they grew larger, they became ſo extremely voracious, that I felt the moſt mortifying apprehenſions leſt a famine ſhould enſue; and my compaſſion for the induſtrious little animals who depended on me ſolely for their daily food and ſupport, was ſo abundantly excited, that the preſervation of their lives became an intereſting object, independent of the advantages I had propoſed to myſelf. I ſought after Mulberry-trees with an anxiety I cannot deſcribe, and the diſcovery of a new one was a real acquiſition. At length my reſources were augmented to the number of twelve trees, though ſome of them were at the diſtance of ten miles from

from me. To theſe the kindneſs of many friends enabled me to ſend every day; and the frequency of my viſits were viſibly diſplayed on all the trees: of the truth of this you will judge, Sir, when I inform you that a buſhel of leaves, crammed in as cloſe as poſſible, would frequently be inſufficient to ſupport them one day.

Towards the latter end of June, they had attained their full growth, when an unexpected circumſtance checked my ambitious hopes, (for until then I had certainly entertained the extravagant idea that I might poſſibly gain the golden fleece, which would entitle me to the envied prize) and deprived me of thouſands of my inſects. You will perhaps recollect a moſt awful and tremendous thunder ſtorm, which happened about this period, in the night, and which ſpread a general alarm throughout Eng-

land. On viſiting my manufactory early the next morning, I found that the lightning had ſtruck ſeveral of the pans; for I cannot believe that the noiſe of the thunder could occaſion ſuch appearances. A large pan immediately oppoſite to the window, containing about five hundred Silk-worms, was full of a liquor as yellow as gold; and all the little animals who had been its inhabitans, were dead, and as apparently ſcorched up, as if they had undergone the operation of fire; while others of the pans had been only partially affected. I removed all the dead; but my misfortune did not end there; for three ſucceeding days preſented me with ſuch numbers who had equally felt the baneful effects of the lightning, that my immenſe ſtock was reduced to two thouſand eight hundred and ninety-three: theſe were exceedingly fine and healthy, and they began ſpinning on the 7th of July.

During

During all this time, they had no other attendant than myſelf, except when the pans were to be cleaned, which was about once a week, and in that office I was aſſiſted by a ſervant. I fed them three times a day with leaves which had been gathered in the morning, and they took up ſo ſmall a portion of my time, that neither my amuſement, nor any other avocations, were interrupted by it.

By means of a ſmall and very ſimple machine, which I invented for the purpoſe of winding the ſilk, I was enabled to get through that taſk very expeditiouſly. I ſelected two hundred and fifty of the largeſt Cones, and from them I wound the ſkean which I have ſent you; its weight is three quarters of an ounce and one drachm. However, upon an average, I find that three hundred and ſixty Cones produce an ounce; for, from the two thouſand eight hundred and ninety

ninety-three, I had exactly half a pound of ſilk: the whole is preciſely of the ſame colour, texture, and height of gum with the incloſed.

Of the waſte ſilk with which the Cones are ſurrounded, I had ſomewhat more than a quarter of a pound; and I ſent it ſome months ago to Nottingham, to be carded and wove into ſtockings. It was my deſign to have ſent thoſe ſtockings alſo, for the inſpection of the Society; but the Manufacturer has not yet returned them to me.

I am determined to perſevere until I have procured a ſufficient quantity to make a piece of ſilk; but the difficulty which attends the meeting with food, and the unpleaſant circumſtance of being ſo very troubleſome to one's friends, renders it neceſſary for me to proceed by a ſlower progreſs than I had hoped for.

From

From the recital I have given, it will appear very obvious, that a number not leſs than thirty thouſand muſt be fed, to obtain five pounds of ſilk; and that the leaves of twelve large Mulberry-trees (allowing that they were not abſolutely ſtripped) were ſcarcely found adequate to the ſupport of ten thouſand.

The eaſe and ſucceſs with which I managed my manufactory, will, I think, make it equally apparent, that, if it be poſſible by any means to ſtimulate the ſpirit of making Mulberry plantations, the whole difficulty is overcome.

The expence of erecting a place for them would be very trifling; and from the little trouble I myſelf experienced in the management of my ten thouſand, I am of opinion that two perſons would be ſufficient to take care of a whole manufactory, until they begin to ſpin. The period they lived with

me

me was about ſix weeks. The calamity mine ſuffered from lightning, is not to be adduced againſt me: that was certainly no common occurence; and if it were, might be guarded againſt, as mine were in an expoſed ſituation.

Amidſt the ſcarcity of food, which threatened me, I tried moſt of the different leaves to be found in a large kitchen garden; but the ſilk-worm would eat none, except Lettuce and Spinage; and they periſh even on thoſe in a very ſhort time, owing, as I imagine, to their moiſture and coldneſs.

The criterion to judge of the goodneſs of ſilk is, I have been told, by the height of the gum. That mine more than vies with the Italian ſilk, in this reſpect, I thus account for: In their climate, the Chryſalis ſoon comes to life, and it is neceſſary to deſtroy them, leſt, by eating their way out, they ſhould injure the ſilk; and to effect this,

this, they are placed in heated ovens. In ours, where every progreſſion is ſlower, there is ſufficient time to wind off the ſilk, without killing the Chryſalis. I frequently wound the cones out of boiling water, placing them afterwards on dry paper, and always found that the Chryſalis came to life again, at its proper time.

If therefore the Chryſalis could bear ſo great a degree of heat as boiling water, it is obvious that the warmth of the ovens, and the length of time neceſſary to keep them there, muſt greatly injure the ſtrength and gloſſy hue of the ſilk. But this is not all; for in Italy they ſuffer the moth to eat its way out of the largeſt Cones, in order to have eggs from the moſt healthy, and thereby loſe all the ſilk in thoſe Cones. Here the ſilk may be gathered, as well as the moth preſerved; and thus do we poſſeſs two ſtriking advantages, which amply compenſate for the loſs of many others. Upon the

the whole I am decidedly of opinion, that this great article of commerce, which uſe and luxury have rendered ſo eſſential to our comforts and conveniencies, and for which ſuch immenſe ſums are annually ſent into other nations, may be cultivated at home with the greateſt eaſe, and with the utmoſt certainty of ſucceſs.

You will conceive, Sir, that I muſt feel a degree of anxiety to learn whether I am honoured with any attention from the Society; and on your politeneſs I preſume to rely for that information.

I remain, SIR,

Your humble ſervant,

HENRIETTA RHODES.

*Bridgnorth,*
Dec. 22, 1784,

Mr. MORE.

SIR,

THE marks of approbation which the Society honoured me with laſt year, together with your polite wiſhes to hear from me again, have determined me to communicate the ſucceſs which has attended my management of Silk-worms this ſummer.

I think I mentioned in my laſt letter that the difficulties I had encountered in procuring Mulberry leaves, had ſo far checked the ardour of my ambition, that I ſhould greatly limit the extent of my manufactory another ſeaſon: I accordingly preſerved only one ſheet of writing paper covered with eggs; and in order that the Worms might have the advantage of the hotteſt ſummer months, theſe eggs were not expoſed to the ſun until the morning of the firſt of June; before night, ſome hundreds

hundreds were hatched, and in a day or two the whole made their appearance. Having convinced myſelf, by repeated experiments, that the Lettuce was the only food which could be relied upon next to the Mulberry, I had cauſed ſome large beds to be carefully cultivated; and it now remained for me to make trial how long they would ſubſiſt upon theſe without injury to their growth, or the produce and texture of the ſilk. They were ſo extremely fine and healthy, that I fed them ſolely with Lettuces until the 24th of June, a lunar month within four days, and more than double the time they uſed to be kept from the leaves of the Mulberry-tree.

In leſs than a week after their change of food, they began to ſpin, and I had the pleaſure to obſerve that the Cones were as fine and firm as any I ever had.

By the latter end of July, the whole buſineſs was completed, and I had wound

exactly

exactly four thouſand cones, which produced me eleven ounces of ſilk, preciſely the ſame as the ſpecimen you have ſeen. I am tempted to entertain very ſanguine hopes from the diſcovery that the Silk-worm will ſubſiſt, ſo long a period of its little life, on an indigenous plant ſo eaſily procured; the more eſpecially ſo, as I did not loſe a dozen during the whole time of their feeding, and can demonſtrate that the cones were not inferior in ſize and weight to thoſe which have been manufactured in Italy.

Mrs. Williams, in the account ſhe has given of her management of Silk-worms, (ſee the ſecond Vol. of the Tranſactions, page 153) aſſerts that two hundred and forty-four produced near an ounce and half of ſilk. Upon an average I have collected no more than one ounce from three hundred and ſixty of mine; but this apparently material difference between us, will

be found to exiſt only in the ſtatement of facts.

Conceiving that the premiums offered by the Society, extended merely to that ſilk which may be manufactured without carding, I held it incompatible with my ideas of truth and candour, to bring the waſte or carding ſilk into the account; otherwiſe I ſhould at all times have been able to double my quantity. For the looſe ſilk which you muſt ſtrip from the Cones, before you begin to wind, together with ſome that will remain round them at the laſt, notwithſtanding the utmoſt care, is nearly one third more than that which I have underſtood to come under the denomination of merchantable ſilk; and thus this year I might have boaſted of twenty-five ounces inſtead of eleven, if, like Mrs. Williams, I had included the ſilk for carding.

In a Treatiſe which lately fell in my way, addreſſed to the Truſtees for eſtabliſhing a

ſilk

ſilk manufactory in Georgia, the author*, who ſeems perfectly well informed on the ſubject, tells us that the Cones in general are found to contain three hundred yards of ſilk, which weighs no more than two grains. Happy to meet with a piece of information which would enable me to aſcertain the degree of perfection I had brought the Silk-worm to, I meaſured the ſilk from one Cone, with the moſt critical exactneſs, and found it contained four hundred and four yards, which, when dry, weighed three grains; and this was from one of the Worms which fed only a week upon Mulberry-leaves. I muſt, however, acknowledge that, although this Cone exceeded the given quantity in weight and meaſure, all were not equally fine, and that I purſued the thread through all its intricacies, with a moſt perſevering patience.



* The Rev. Samuel Pullein.

Mrs. Williams's obſervations on the various kinds of leaves they will eat, admitting their truth, can never be of the leaſt utility, unleſs to gratify the curioſity of the ſpeculative philoſopher. She talks of gathering cowſlip-leaves, in October, but they vegetate luxuriantly only in the ſpring; and neither could they nor the leaves of the Blackberry, even then, be procured in ſufficient quantities to ſerve a manufactory. Of the young leaves of the Elm, I myſelf made trial, to the deſtruction of nine Worms out of twelve, which I gave them to. The remaining three I reſcued from the ſame fate, by giving them the Mulberry leaf; but they never recovered their ſtrength ſufficiently to form a Cone.

I alſo adopted the ingenious hint of the Honourable Daines Barrington, and collected thoſe kinds of leaves which were ſimilar to the Mulberry, in taſte and appearance;

pearance; ſuch as the Nut, Currant, Lime, Kidney Beans, Strawberry, Cheſnut, Raſberry, &c. &c. but none of theſe would do. The Cabbage leaf, (of which I was induced to make trial, becauſe it is made choice of by our common Caterpillar) was preferred to either of theſe, though ſparingly eaten of; and I had no wiſh to try the effect of their continuance at this food, as the ſmell would render it unfit for a large manufactory. A female friend of mine, who had kept Silk-worms, many years ago, aſſured me that they devoured Aſh-leaves with great avidity; and a gentleman of my acquaintance, likewiſe told me that his ſiſter uſed to give them Vine-leaves. The latter, mine would not venture to begin upon; and of the former, they were ſatiated at one meal.

Mr. Barrington ſuggeſts that it might poſſibly be diſcovered what leaf the Silk-

worm would live beſt upon, if we were to obſerve what inſect made the Mulberry its ſuccedaneum; it has therefore eſcaped the notice of that learned inveſtigator into the phœnomena of nature, that no other inſect whatever will feed upon the Mulberry-leaf, or is even found upon it. I ſpeak from my own obſervation, and from the experience of three years, in which, during the time I made uſe of the Mulberry-leaves, a buſhel at leaſt have paſſed through my hands in a day, and I never yet found a ſingle inſect amongſt them, or a leaf which had the ſmalleſt part eaten away.

Until the laſt rain fell, our fruit trees, and even the more lowly vegetables, were covered with myriads of inſects; the Mulberry alone remained ſacred from their depredations. As this circumſtance is curious, Mr. Barrington will perhaps thank you for the information. Indeed, every

every thinking mind will find new cauſe, from it, to adore the goodneſs of the great Creator, who, in his wonderful œconomy of nature, has thus bountifully ſecured food to the reptile whoſe labours were to be of ſervice to man.

I cannot agree with Du Halde, in thinking that noiſe is at all prejudicial to the Silk-worm. Mine were ſo ſituated that they were expoſed to all the ſounds incidental to a country town, from the barking of dogs, up to a family concert; and I am ſure they never were viſibly affected by either. They certainly have but one night and one day throughout the whole of their exiſtence. They eat perpetually from their firſt appearance, until they become Chryſalis's, which I imagine to be their only ſtate of reſt. If properly ſecured from birds and thoſe inſects which make others their prey, they do not appear liable to any

dangers except that of lightning; and perhaps this they ſhare in common only with other tender animalculæ. The effect which we commonly attribute to thunder ſtorms, that of inſects being waſhed from the trees by rain, has more probably its cauſe in lightning, which, on the principles of electricity, muſt deſtroy millions.

Mrs. Williams thinks that the Silk-worm waſtes its ſilk by being moved incautiouſly; but a power of throwing out a fine thread, in its very early ſtate, is enjoyed alſo by various other inſects, and was given, no doubt, by Providence, to prevent the extinction of the whole ſpecies, by violent rain or wind: by this thread they will hang ſuſpended, and reſiſt a torrent of water, unleſs lightning ſnap the web, together with their lives. The Silk-worm, however, loſes this property with its firſt coat; for it is then

able

able to crawl with celerity, and provide for its own ſafety.

I am very far from thinking it impoſſible to procure two crops of ſilk in a ſeaſon in this climate: the attempt, however, cannot be made with ſucceſs, until the planting of Mulberry-trees has engaged the attention of the nation; and I ſhould rejoice greatly to ſee that once more become a matter of royal conſideration. So trifling a number as two or three hundred, may be reared almoſt in any ſeaſon; but I allude to a manufactory of ſuch extent as might afford other gratifications beſides thoſe of curioſity.

I have ſcarcely a more predominant wiſh at preſent, than that of being able to produce the firſt quantity you propoſe, five pounds in one year; and I have actually preſerved eggs to ſupply me with thirty thouſand Worms: this idea, however,

I never could have entertained, had I not arrived at the certainty of their living upon Lettuce leaves for ſo long a period; and circumſtances muſt ſtill determine the completion of my plan.

Hitherto I have been able to conduct the whole myſelf; but if I purſue my deſign, I muſt call in aſſiſtance, and devote much more time to the ſuperintendance of the buſineſs.

If my ſcheme is carried into execution, the eventual ſucceſs of the enterprize ſhall be communicated to you, Sir, by

Your moſt obliged humble ſervant,

HENRIETTA RHODES.

*Cann Hall,*
Auguſt 24, 1785.

Mr. MORE.

# PAPERS

IN

# MECHANICKS.

# MECHANICKS.

*In the Year* 1779, *a Bounty of Twenty Guineas was given to* Mr. ROBERT SAMPSON, *of* Petty France, Weſtminſter, (*ſee the* IId. *Vol. of the Tranſactions, page* 186,) *for his Invention of a Chime Clock, of which a Print and Deſcription is here publiſhed.*

SIR,

I BEG the favour of you to lay the incloſed letter and drawing of a Clock, before the gentlemen of the Society at their next meeting; and am, Sir,

Your humble ſervant,

ROBERT SAMPSON.

*Petty France, Weſtminſter,*
Nov. 23d, 1779.

Mr. MORE.

MY LORDS AND GENTLEMEN,

PERMIT me to lay before you, my firſt attempt towards the improvement of Chime Clocks, which if it meets with your approbation, I am willing it ſhall be made public, as I am certain it will be of general uſe; for by this method, Chime Clocks, either of the ſpring or weight kind, may be made much cheaper than by the common methods now in uſe, and yet will perform all the ſame buſineſs, and may be made, to all outward appearance, in every reſpect the ſame.

It is an eſtabliſhed maxim in mechanicks, that the more ſimple any machine can be made, the better it is for uſe. On this principle alone I am willing to reſt the merit of my performance, being certain there is one third part of the work excluded from the internal ſtructure of this Clock, which is abſolutely neceſſary in the preſent methods

methods of making Chime Clocks, now in uſe; and this will at leaſt ſave one third of the expence in making, which I hope is an object worthy of conſideration both to the merchant and the mechanick.

I beg leave to obſerve, that whoever examines the mechaniſm of this Clock in an impartial manner, muſt confeſs that the ſame duty can be as ſafely performed by one train of wheels in this as it can by two trains of wheels in the common method; becauſe, in this Clock, the wheels of communication are puſhed into their place before the Clock gives warning; and that warning makes it ſafe, for the locking cannot drop into its place again, therefore the Clock muſt chime and ſtrike: but in common Chime Clocks the uſual way of diſcharging the Chime is by a flirt, which in many inſtances has been known to fail.

I have already made a Clock on the before-mentioned principles; and as a view

of

of it will convey a clearer idea than any deſcription I can give, I am willing to attend with it myſelf, when agreeable, and beg leave to ſubſcribe myſelf, with all due reſpect,

MY LORDS AND GENTLEMEN,

Yours to command,

ROBERT SAMPSON.

*Ship Court, Petty France,*
*Weſtminſter,* Nov. 23d,
1779.

To the Society for Encouragement of Arts, &c.

DES-

# Mr. Sampson's Chime Clock.

# DESCRIPTION

## OF THE

# TWO-PART CHIME CLOCK

Invented by ROBERT SAMPSON,

*Ship Court, Weſtminſter.*

THE pieces A, B, D and E, all move together on the center C: the wheels of communication marked 24 each, are both on one arbor, and commuuicate motion from the pin wheel in the ſtriking trane to the chime barrel. When the pin in the minute-wheel begins to lift the piece D, conſequently the piece E will puſh the wheel 24. into the teeth of the pin-wheel now at reſt before the Clock gives warning. Alſo B will be lifted out of

the locking plate, and A will be moved over the Detent on which is the hammer tail F, and thereby pump it off the pins in the pin-wheel, and prevent it from ſtriking the hour bell while the muſic is playing. When the rack is diſcharged, and the warning piece G has dropped off the pin in the other minute-wheel, the ſtriking train will be in motion, and turn the chime barrel, which while it is playing, the pin at H prevents the hook from gathering up the rack.

When the chime has done playing, the ſmall ſpring I puſhes the wheels 24. out of the teeth of the pin wheel; and the pieces A, B, D, and E, return into the places as preſented in the callipers, and then the Clock ſtrikes the hour.

*In conſequence of the following Letters and Certificates, two Guineas were adjudged to Mr.* ALEXANDER MITCHELL, *and two Guineas to Mr.* ROBERT ANDERSON; *being Premiums offered for taking Whales by means of the Gun Harpoon, in* 1784.

SIR,

THE bearer was Harpooner in the Earl of Chatham, Captain Brown, of which I am part owner. By the Certificate which he brings, you will find they killed one fiſh out of five, with the Gun I ſent to the Society laſt year, having in it one of my Harpoons.

Out of three ſhips, we loſt one, viz. the Achilles; the other two were were ſucceſsful. The Gun Harpoons were uſeful in two or three other inſtances; but this was the only fiſh firſt ſtruck with a Gun Harpoon.

I am, SIR,

Your very humble ſervant,

NATHANIEL JARMAN.

*Diſtaff Lane,*
Nov. 4, 1784.

Mr. MORE.

THIS

*London, Nov.* 1, 1784.

THIS is to certify that Alexander Mitchell was an Harpooner on board the ſhip Earl of Chatham, of London, William Brown commander, to Davis's Straits, the laſt ſeaſon: and on the 18th day of June, in the latitude of 73° N. and longitude of 53° W. from London, the ſaid Alexander Mitchell ſhot a fiſh with a Gun-Harpoon, at the diſtance of ten fathom: the Gun of the Blunderbuſs conſtruction, loaded with four common Tobacco-pipes of glazed powder. The Harpoon went into the fiſh's back, up to the ring. By the aſſiſtance of the other boats, the fiſh was killed in about one hour.

WILLIAM BROWN,
Commander of the ſhip Earl Chatham.

*By the following Letter, it appeared that* ROBERT ANDERSON, *Spikeneer of the Achilles, which was caſt away on the Leman and Owey, on the 4th of March, 1784, and who was picked up by the Mary Ann, Captain* CHARLES PATTERSON, *killed a Whale by the Gun-Harpoon, in the Year 1784.*

Nov. 14, 1784.

SIR,

THE bearer, Robert Anderſon, fired a Gun-Harpoon, on the 8th of June laſt, in Greenland, at the diſtance of twelve fathom, and killed a fiſh in half an hour. I ſuppoſe the Gun-Harpoon to have been the cauſe of our killing that fiſh, which was eight foot ten inches bone.

I am, SIR,

Your humble ſervant,

CHARLES PATTERSON.

Mr. MORE.

AN eaſy and effectual method of preventing the many fatal accidents with which the uſe of the Walking-wheel Crane is attended, has long been conſidered, both by the Publick and the Society, as highly deſerving the attention of able Mechanicks; and in the year 1762, the Society voted their Gold Medal to the late Mr. Pinchbeck, for his contrivance to anſwer that purpoſe: this was intended to be accompliſhed by a pair of Bellows, which, when the motion of the Wheel becomes greatly accelerated, throws up a catch, and ſtops the whole Machine.

This contrivance, at a conſiderable expence to the Society, was added to one of the Cranes on the Quays below London Bridge; and although it anſwered well the purpoſe it was deſigned for, yet, from that unaccountable inattention to their ſafety which is daily ſeen among labouring

people, it has been ſuffered totally to fall into ruin; but a complete model ſtill remains in the Society's Repoſitory.

The decay which the leather of the Bellows is unavoidably ſubject to, has ever been a great objection to that method of ſtopping Cranes; and the thought of performing the ſame buſineſs by the centrifugal force with which a ball is thrown off when the motion is much accelerated, as ſhewn in Mr. Bunce's Model, which alſo remains in the Society's Repoſitory, is ſo well founded, executed at a ſmall expence, and at the ſame time ſo certain in its operation, and not liable to be diſordered, that it is hoped it will be adopted by thoſe perſons who have the conſtruction of ſuch Machines, and prove an effectul remedy againſt thoſe evils that have hitherto attended the uſe of the Walking-wheel Crane.

It appeared, on due examination of the Model alluded to in the following Letter, that the method of ſtopping Cranes by means of a Ball (inſtead of the Bellows uſed in Mr. Pinchbeck's Model) is new and an improvement.

The Model therefore preſented by Mr. Bunce, was accepted, and ordered to be carefully preſerved in the Society's Repoſitory, and the Silver Medal voted to Mr. Bunce, for this ingenious improvement.

SIR,

SIR,

HAving ſome time ago ſeen Mr. Pinchbeck's Model of a Wheel Crane, an idea occurred to me for making one to anſwer the ſame purpoſe, I preſume ſimpler and ſtronger. My deſign is, inſtead of a pair of bellows, to have a ball ſo connected to a ſmall horizontal Wheel, that, when the Machine moves too faſt, it may, by its centrifugal force, throw a ſtop upon the Wheel. A model of ſuch a Machine you will receive by the bearer, the conſtruction of which will be eaſily conceived without a deſcription of its ſeveral parts. Before the weight is permitted to deſcend, the hook muſt be drawn back as far as poſſible. In drawing up the weight, the ſmall wheel is not immediately diſcharged from the large one, which might cauſe the Machine to ſtop when not required; to prevent which

inconvenience,

inconvenience, the pieces of braſs round the Walking-wheel, which receive the hook, are made inclining, ſo that if the hook drops it does not hold the Wheel.

To regulate the force of the ball, move it higher or lower upon the braſs wire, by which it is ſuſpended.

If it appears to you a Machine of this kind would be of any utility, and you think proper to lay it before the gentlemen of the Committee, it will be a great favour conferred on,

SIR,

Your moſt obedient humble ſervant,

SAMUEL BUNCE.

*Kirby Street, Hatton Street,*
15th December, 1785.

Mr. MORE.

*In*

*In the ſecond Volume of the Tranſactions, page* 223, *may be found an Account of a Contrivance for preſerving Hay-Ricks from Rain during the making, for which the* Silver Medal *was voted to* Mr. RICHARD TOFT, *of* Kentiſh Town. *And it is with much Pleaſure the Society obſerve the Inſertion of that Account has induced the ingenious Writers of the two following Letters, to communicate their Thoughts on that Subject; which muſt be allowed of ſufficient Importance to merit the Attention of all Perſons who wiſh to preſerve ſo uſeful and valuable a Crop from thoſe Accidents of Mow-burning, and even firing, which in wet Seaſons, particularly, it is in imminent danger of, unleſs Care is taken to ſecure them from the falling Rains.*

*The*

*The Thanks of the Society were given to the Rev.* Mr. WARREN, *and to* Mr. AILWAY, *for theſe Communications, which without doubt will be attended with good Effects to the Publick.*

*Pomphlet*, near *Plymouth*,
June 3, 1785.

SIR,

IN the Monthly Review for January laſt, there is mention of a letter to the Society of Arts, &c. from Mr. Toft, of an ingenious contrivance to ſecure Hay Ricks from rain during the making: that the expence of the Machine, which will laſt ſeveral years, is about twenty-ſeven guineas. The expence ſtruck me, for the above is all I know of it, and I think alone ſufficient to prevent the general uſe of it.

I have many years amuſed myſelf with a farm; and as I live in a country ſubject to variable weather, from its proximity to the ſea, I thought of the method I am going to have the honour to lay before the Society, which fully anſwers the purpoſe above mentioned, at leſs than one fourth part of the expence, proportions conſidered; for I am quite unacquainted with the ſize of the Rick which Mr. Toft's Machine is calculated to cover. I ſhall therefore take the liberty to ſend you a deſcription of the whole of my method, though the covering of the Rick is the principal object in queſtion. I have ſcratched out a plan, by which you will ſoon diſcover that I am no great draftſman; yet, ſuch as it is, it may ſerve to make the verbal deſcription more intelligible.

The ſheet may be of very great uſe to Corn Mows which are finiſhed: as the

they do not heat much, a very ſmall opening at top will be ſufficient for them. The ſheet reſting on the corn, and drawn tight, will throw off the rain, and very little affect it.

Three rows of ſtone wall, twenty inches thick, eighteen inches high, with intervals of four feet between the middle row and the two outward ones, ſo that the thickneſs of the three walls being built with ſtone, occupies five feet, which makes the whole of the width thirteen feet. The length of the three rows, is forty-two feet each. This length is for two Ricks to be made at different times; poles fourteen feet long, intermixed with ſhorter ones, are placed acroſs the three walls, projecting ſix inches beyond each outward one, in order to make the baſe of the Rick fourteen feet wide. Theſe poles are thinly covered with faggot wood, ſtraw, or any thing to prevent the Hay from

from falling between the poles, which, if placed pretty cloſe, are alone ſufficient. Thus a great deal of Hay is ſaved from injury by the moiſture it would attract from the ground in the common methods of ricking it.

A brick wall need not be ſo thick; and where poles, &c. are ſcarce, a fourth wall may be added; and thus ſhorter and ſmaller croſs poles, or old boards, will do.—

The length of the three walls, we have ſaid, is forty-two feet; but the baſe of the Rick occupies only twenty feet, and is fourteen in breadth by the poles projecting ſix inches each ſide. When the Rick is four * or five feet high, a ladder twenty-two feet long, at leaſt, is placed perpendicular quite in the middle, at the end of the wall, and reſts againſt the Hay. It is let into the ground, eight or nine inches, and

* It may be done at firſt; but no one would begin a Rick of Hay, if it was likely to rain.

and rammed down tight. At the other end of the Rick, thus begun, a ſpar or pole, twenty-two feet long, and about fifteen inches in circumference at the bottom, is fixed in the ground to the ſame depth, as near the middle as the central wall will admit.—Then another ſpar or pole, twenty-four feet long, runs over the whole length of the Rick, being faſtened with a moderate-ſized rope to the ladder at one end, and to the ſpar at the other, high enough to prevent any obſtruction to the making the Rick. The croſs ſpar is raiſed or lowered in a few minutes; but it ſhould always be ſix feet above the ſurface of the Rick, when the covering is placed on it. This covering is a ſail-cloth ſheet, twenty-two feet long and twenty-four wide, ſewed together as the ſail of a Veſſel is. * The ladder and ſpars being already placed, and the ſail ſheet lying by, in caſe of a ſhower or the ſudden appearance of much rain, the ſheet is ſoon thrown over the



* Old ſail cloth, if found, will laſt ſome years.

croſs ſpar, and deſcends fourteen or eighteen inches or more, according to the aſcending increaſed bulk of the Rick. To prevent its being blown from its place, and to keep it tight, that no folds may be in it, three ropes at leaſt, faſtened to eyelet holes on each ſide, deſcend to the ground two or three feet from the baſe of the Rick, and there are fixed with hooked ſtakes or to any heavy body, which may prevent the ſheet from blowing about: the ſheet thrown over the ſpar raiſed ſix feet from the ſurface of the Rick, leaves a ſufficient paſſage for the cool air to blow through, and carry off the ſteam ariſing from the hay. Should the rain beat much againſt either of the openings, the ſheet may be drawn cloſer, to prevent it.

The machinery, Sir, you perceive, is very ſimple, eaſily put together, and eaſily taken to pieces. A farmer is ſuppoſed to have one ladder at leaſt of the length required

quired here; and if he has two, the croſs ſpar only need be purchaſed, ſince by beating out one of the ſteps of the ſecond ladder, and placing it over the middle wall, where two Ricks are to be made, it will anſwer the purpoſe as well as the ſpar: the price of the ſheet in this country, is ſix pounds fifteen ſhillings, and cannot be much more any where. It may be boiled with bark, as fiſhermen do their nets, or as the ſails of ſmall craft often are: it is a great preſervative of the canvas.

It may be uſed for a ſecond Rick, &c. or Corn mows the ſize of Ricks, or mows requiring more or leſs ſheeting: an additional ſeparate canvas, and a longer croſs ſpar or two, laſhed together, may be advantageouſly uſed: the only attention to make it laſt many years, is the putting it away dry. I would by no means adviſe the uſe of tar, or tar mixed with greaſe about it; it adds to its weight too much,

and cracks it when cold; it will throw off the rain without it. This machinery is applicable only during the time the Rick is making up to the roof, be it a day or a month, either by hindrance from weather, or by waiting till more hay is made to increaſe the Rick to its intended bulk. When the roof is quite formed and well raked down, it cannot take any great damage; but even then the ſheet may be thrown over it a day or two, but not longer: the heating of the hay, which would be increaſed thereby, would gradually injure the canvas. The price of the ſpars is about eight or nine ſhillings. I am, with reſpect to the Society,

SIR,

Your moſt humble ſervant,

VINCENT WARREN.

Mr. MORE.

SIR,

BEING fully ſenſible of the patriotic views of the honourable Society for the Encouragement of Arts, &c. and their diſpoſition to judge favourably of any attempts to forward uſeful improvements, and being beſides impreſſed with gratitude for the advantage I have received from papers publiſhed under their patronage, I beg they will acccept the Model of a Cloth which I have uſed ſome years with great advantage, while making Ricks of Hay and Corn. I very much regret I could not find a workman able enough to make it with elegance; and was merely deterred from offering it on that account, until hearing a contrivance of this kind had been approved of by the Society, and it being ſuggeſted in a critical review that the expence would probably pre- its uſe.

I imagined that my contrivance, being more ſimple, and not half the coſt, might merit ſome attention; beſides, it would be ſtill cheaper, if half-worn canvas was uſed inſtead of new. My cloth was made by Mr. Welford, or Tower Dock; it contains one hundred and fifty-five yards of Engliſh Duck, at one ſhilling and ſixpence per yard: the blocks, cordage, &c. and making, in all, thirteen pounds two ſhillings and ſixpence. The carpenter's bill added, makes the whole expence, fourteen pounds five ſhillings, beſides the wheels. Under this cloth, I make Ricks containing thirty-five or forty loads of Hay. Mr. Welford obſerved his charge was ſomewhat more, on account of the novelty of the work; and indeed I gave him a good deal of trouble. The dimenſions of this cloth may be enlarged about one fourth, I think, with great propriety.

The

*The method of uſing the cloth.*

Two ſcaffold poles, twenty-eight feet long, (if ſix feet longer, it would be better) fix the poles in two Cart-wheels; one ſpade full or two of earth is dug up juſt to admit the nave of the Wheel into the ground: if, from the inequality of the ground, the rims of the Wheels do not apply, put under the hollows a brick, tile, or piece of wood, which will keep it ſufficiently ſteady.

Two ſtakes drove a foot into the ground on each ſide the uprights to which the ſtays are faſtened: the rings that ſuſpend the cloth, are of wood; the croſs piece, thirty-two feet long and ten inches round: the uprights being placed at their proper diſtance, paſs the croſs piece through the rings of the cloth; faſten the rope that comes from the pulley, at the top of the uprights to it: two ſmall blocks are

faſtened to the under ſide of the croſs piece at each end, with two ſmall cords reeved in them; their uſe is to draw the cloth from or over the Rick, which will be facilitated by hoiſting one end of the croſs piece.

On beginning a Rick, hoiſt the cloth half up, and confine the croſs piece to the uprights, by a turn or two of a cord; during the work, draw the cloth over, and take care to pin down its edges in ſuch manner that the wing cannot get under it. If wind with rain ſets in at either end of the Rick, you may lay on a little ſtraw. When the Rick is ſo far advanced that the croſs piece is in the way of the workmen, it may be removed, either for another Rick, which is done in a very little time, or to be laid by. When you lay it up, take care it be dry; wrap it up with all its parts, acd hang it up on ſome hook faſtened

to

to a beam in the middle of a room, which will effectually preſerve it from Rats, &c.

I am, SIR,

Your very humble ſervant,

JOHN AILWAY.

Mr. MORE.

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Some obſervations made by Mr. AILWAY, on deſtroying Inſects in Hot Houſes, and preventing the depredations of Vermin on ſeeds ſown, will make part of a future Volume of theſe Tranſactions; and the Model mentioned in the foregoing letter is preſerved in the Society's repoſitory.

*The*

*The Thanks of the Society, and a* SILVER MEDAL, *were preſented to Mr.* JOHN ADAMS, *Maſter of an Academy, at* Edmonton, Middleſex, *for his Invention of an artificial Horizon to be uſed on Land; and for his Communication of the ſame to the Public, by means of the following Letter and hiſtorical Account addreſſed by him to the Society.*

*At the Committee to whom the Conſideration of Mr.* ADAMS's *Invention, and the Merits of his artificial Horizon were referred, it was declared by Mr.* DOLLOND, *with that Candour and Liberality which have conſtantly formed parts of his Character, that although he had made many Inſtruments on the Principle laid down, yet the Honour of the original Improvement was certainly due to Mr.* ADAMS.

GENTLEMEN,

*February* 24, 1785.

GENTLEMEN,

PERMIT me to addreſs myſelf to you, the patrons of genius.

Few men can claim many uſeful inventions to their own ſhare; I have laboured to attain many, but have been too often unſucceſsful. One, I can claim as my own, viz. an artificial Horizon, the principles of which I communicated ſome years ago to Mr. Dollond, and am pleaſed to find that, through his care in the conſtruction, it is gotten into univerſal eſteem: all I wiſh is the honour of being recorded the inventor, in any manner conſiſtent with the plan of your Society. I ſhall be happy at any time to attend and make my claim; but flatter myſelf, that Mr. Dollond, who is one of your honourable Society, will be a ſufficient voucher for, GENTLEMEN,

Your obedient humble ſervant,

JOHN ADAMS.

To the Society of Arts, &c.

AN

# AN HISTORICAL ACCOUNT AND DESCRIPTION OF AN ARTIFICIAL HORIZON,

*For determining the apparent Altitudes of the* Sun, Moon, *or a* Star, *to a great Exactneſs, on Land, with* HADLEY'S Quadrant *or* Sextant; *by* JOHN ADAMS, *Teacher of the Mathematics at* Edmonton, Middleſex.

I HAD long been perſuaded in my own mind, that if a ſolid horizontal reflecting plane could be procured, it would obviate

obviate the difficulties and imperfections ariſing from the uſe of fluids for that purpoſe, ſuch as Water, Treacle, Quick-ſilver, &c.

About the year 1764, I purchaſed one of Siſſon's circular ſpirit levels, to which I cauſed three adjuſting ſcrews to be adapted; but the glaſs (a plano-concave) which covered the ſpirits, being the ſegment of a ſmall globe, I could never certainly determine with it the apparent altitude of an object within five or ſix minutes. Some time afterwards I had another glaſs fixed in the place of the former; the concave ſide of which was the ſegment of a globe, near thirty feet radius: with this I could certainly determine the altitude within three minutes, and found it very uſeful in windy weather, when my fluids, though covered with inclined glaſs planes, were liable to be agitated.

In

In the year 1778, a glaſs with parallel planes was adapted to my level, in lieu of the plano-concave; this alteration anſwered my moſt ſanguine expectations. I then communicated my improvement to Mr. Dollond, who has ſince made many of them, one of which is in my poſſeſſion, and anſwers my utmoſt expectations. I have had the pleaſure to hear from ſeveral gentlemen, who have uſed it in different parts of the world, the moſt flattering account of its utility.

In 1783, the inſtrument was known in ſeveral parts of Europe by the name of the Dollondonian Horizon, from the attention that gentleman had paid to the conſtruction of it, which was the cauſe of my writing the foregoing letter to the Society.

A particular deſcription of an inſtrument, ſo well known, and which may be ſeen in the hands of almoſt every practical aſtronomer,

ſtomer, ſeems needleſs; it being nothing more than a very ſhallow cylindrical braſs veſſel, with a glaſs cemented on the top, and three adjuſting ſcrews from the circumference, which ſerve for legs; alſo a ſmall hole in the bottom, or in the circumference, through which it may be filled nearly, with ſpirits or any fluid; which is kept in by a ſcrew adapted to the hole, ſo that the vacuity of fluid, or what the cylinder wants of being full, will be a bubble of air floating upon the fluid, againſt the lower ſurface of the glaſs: this bubble may be half the diameter of the cylinder, more or leſs; but leſs is better. In hot climates it may ſometimes be neceſſary to open the hole, and let part of the air which compoſes the bubble eſcape.

## PRINCIPLE.

Granting that a piece of glaſs can be ground ſo as to have parallel planes; which

is

is ſaid to be poſſible by all the workmen of whom I have enquired; then if the bubble be brought to reſt during a few ſeconds any where againſt the lower plane (which is not poliſhed quite bright), but the nearer the centre the better, the upper plane will be very nearly a perfect horizontal reflecting ſurface.

## IMPERFECTION OF A PLANO-CONCAVE GLASS.

Some artificial horizons are ſtill made on this principle; but it is very improbable that the glaſs ſhould be put in ſo exact, that the upper part of the ſegment ſhal be in the centre of the reflecting plane: this may occaſion an error of two or three minutes. Again, ſuppoſing it juſtly cemented in, the eye cannot determine when the bubble is exactly in the centre, which, if not, the reflecting plane will be inclined

inclined ſome minutes from the parallel of the horizon.

There ſeemed to be nothing wanting to render this inſtrument univerſal on land but a portable inſtrument on Hadley's principle, that would meaſure a ſemicircle or 180 degrees; this circumſtance I happened to mention to Meſſrs. Gregory and Wright, who immediately preſented me with an improved Quadrant, by which the fore and back obſervations are equally facile and juſt: with this Quadrant and my Level, I determined the latitude of Southampton, Portſmouth, and Newport in the Iſle of Wight, each within a minute of the moſt accurate obſervations hitherto made, and that at the ſummer ſolſtice, when it was impoſſible to take the double of the Meridian Altitudes, by reflection with any Sextant.

## METHOD OF USING THE ARTIFICIAL HORIZON.

Set the artificial horizon on a firm ſtone or wooden ſurface; then, by moving the adjuſting ſcrews, bring the bubble to reſt near the centre of the glaſs: if the bubble ſtand there five or ſix ſeconds without perceptible motion (and I have known it ſtand twice the number of minutes), be aſſured it is very nearly an horizontal plane; and the double apparent altitude may then be meaſured by it to leſs than half a minute; conſequently the apparent altitude within fifteen ſeconds; which is perhaps nearer than moſt portable Quadrants will determine an angle.

It will not be amiſs here to note that it is the attraction of the neareſt or moſt denſe ſide of the circumference of the horizon

horizon that draws the bubble from the centre; notwithſtanding which, the plane remains the ſame.

Now the horizon being adjuſted, take your Quadrant or Sextant in your hand, move backwards or forwards in a line of direction with the object, until you ſee it (ſuppoſe the Sun or Moon) reflected from the ſurface of the horizon to the eye; then with your Quadrant bring the object down, until the two neareſt edges touch, that is, the edge of the object ſeen in the Quadrant and the edge ſeen by reflection from the ſurface of the horizon: this will hold good, whether you obſerve with a Teleſcope adapted to the Quadrant which inverts the object, or with the naked eye. Half the angle thus meaſured by the Quadrant, or Sextant, will be the apparent altitude of the objects's lower limb.

## EXAMPLE.

| | ° | ′ | ″ |
|---|---|---|---|
| Obſerved double Meridian Altitude of Sun's lower limb Jan. 28th, 1786. | 40 | 8 | 0 |
| Half | 20 | 4 | 0 |
| Refraction | | 2 | 34 |
| Appt. Alt. LL | 20 | 1 | 26 |
| Semidiameter | | 16 | 17 |
| True Alt. of centre | 20 | 17 | 43 |
| Zenith Diſtance | 69 | 42 | 17 |
| Declination South | 18 | 4 | 11 |
| Latitude North | 51 | 38 | 6 |

This obſervation was taken near Edmonton Church, the latitude of which is 51° 37′ 58″ North.

But

But if the back obſervation of Wright's Quadrant, above mentioned, be uſed when the Altitude of the object is more than 45 degrees, what you read off from the Quadrant muſt be added to 90 degrees; then half the ſum will be the apparent Altitude of the lower limb.

SIR,

THE above you ſhould have had ſooner, but I have been extremely ill. I hope I have not intruded beyond the bounds of decency on your publication.

I am your humble ſervant,

JOHN ADAMS.

Mr. MORE.

# PAPERS

## RELATING TO

# COLONIES AND TRADE.

## COLONIES AND TRADE.

THE obtaining the products of the Eaſt, and the tranſporting them in a growing ſtate to the Weſt Indies, has ever been an object of conſideration with the Society, and premiums have been from time to time offered for that end. The following papers, therefore, which contain a ſhort hiſtory of the introduction of that admired fruit the Mango, into the American Iſlands, will doubtleſs be well accepted by the publick. And it is highly pleaſing to the Society, that it has fallen to their lot to lay the firſt well-authenticated account of the introduction of the true Cinnamon Tree into the Iſland of Jamaica; which, if the account given in the letter from Mr. Wilſon admits of a doubt, from the great variety of trees of that ſpecies growing in the Eaſt, which

which may perhaps be the caſe, yet is rendered certain by a compariſon made of the leaf therein mentioned with ſome of the leaves of the true Cinnamon, preſerved among the dried ſpecimens in the firſt botanick collection in this, or perhaps any other kingdom,

*The following Account of the Introduction of the* Mango Tree, *by* WALTER MAYNARD, Eſq. *into the Iſland of* St. Vincent, *having been received, Thanks were ordered to that Gentleman for the Communication; and the Society having written to* Joſhua Steele, Eſq. Preſident of the Society of Arts, &c. *at* Barbados, *the Letters on the Culture of the* Mango Tree *in that Iſland, which are now inſerted, were received; and Thanks for the Communication were ordered, together with Samples of the Hemp and Flax from* China, *mentioned in Mr.* HOY's *Letter* (page 35); *that, as ſome of them did not ripen in this Climate, Trials might be made of them in* Barbados; *and the Event of thoſe Experiments are intended to make part of a future Volume of theſe Tranſactions.*

## A NARRATIVE

*Of Facts relative to the propagating the* MANGO TREES, *from the* Eaſt-Indies, *to the* Weſt-Indies.

WALTER MAYNARD, being a native of the Iſland of Nevis, in the Weſt-Indies, and ſailing from Madraſs, touched at the Iſland of Bourbon, in his way to Europe; and having taſted the Mangoes of that Iſland, and finding they were a moſt delicious fruit, was induced to have ſome young Mango plants put in pots, with earth, in order, if poſſible, to plant them in the Weſt-Indies, and was happy enough to meet a Weſt-India packet, at ſea, which induced him at that time to go in her to the Weſt-Indies, and was ſo fortunate as to eſtabliſh them in the Iſland of St. Vincent; ſince which, they have fruited, and are now propagated in almoſt all the Weſt-India iſlands.

Mrs.

Mrs. Jackſon, a widow lady, lately of St. Vincent's, will atteſt this to be a real hiſtory of this matter, as her late huſband had the firſt tree that fruited in that Iſland from the ſaid plants.

WALTER MAYNARD.

N. B. This happened in the year 1770. Doctor Young, of St. Vincent's, was alſo furniſhed with one of theſe Mango Plants, which has borne fruit.

SIR,

AS I think it one of the leaſt returns I can make for the favour you granted us in the Iſland of St. Vincent, by a preſent of the Mangoes; I do here atteſt, and am ready ſo to do whenever applied to by any gentlemen of the Society, that you brought the plants to the Weſt-Indies, in the year 1770, and perfectly remember it to be in the month of June.

The tree you left, I am ſorry to ſay, was loſt in the hurricane we experienced in 1780; but there are now many trees from the ſeeds of it that will bear this year. There were four plants ſent to the King's gardener at Kew, about ſix years ago, and I am informed one is now living.

I am, SIR,

Your moſt obedient ſervant,

ELIZABETH JACKSON.

*March* 11, 1784.

WALTER MAYNARD, Eſq.

SIR,

THE following are all the the circumſtances I have been able to collect relative to the hiſtory of the old Mango Tree, that is now growing at the Guinea, and which are pretty exact, and may be depended on.

The above Tree was ſent up to the plantation in a box, (being about eighteen inches high) by Mr. Edwin Laſcelles, about the year 1742 or 43. Our Carpenter, John Thomas, a Mulatto, but a ſenſible and intelligent man, ſays, he perfectly remembers his aſſiſting in railing of it round, and was then about twelve years of age; he is now about fifty-five. He further ſays, the dwelling was then finiſhed, which appears from other circumſtances. Mr. Walker, I am pretty certain, purchaſed the Guinea, in the year 1756: the Tree had not then bore any fruit, nor did it bear any for four

or

or five years after, when a Mr. Williams was the overſeer, who, as well as I can remember, was employed about the year 1760 (the Negroes reckon time paſt by the different overſeers put over them): it had however put out bloſſoms yearly for three years before it fruited; but by the beſt accounts, no fruit was produced till about the year 1761, eighteen or nineteen years after it was planted at the Guinea; and, from its growth then, it may be ſuppoſed to be near a twelvemonth from the time the ſeed was put into the earth.

The three young trees were planted with ſeveral others by Mr. Moe's direction; about three years after, Mr. Rochford had the care of the plantation, and he came to live on it in 1764, not later than 65; ſo that they muſt have been planted ſixteen or ſeventeen years, and it has not been till this year that bloſſoms have appeared,

and

and that only on one of them, which is by far the moſt flouriſhing and larger of the three: whether fruit will follow the bloſſoms on the young trees, or drop as in the mother tree, will now ſoon be determined.

The young trees have not, I believe, increaſed in their growth, for the time they have been planted, as the original, which may be accounted for. We have had, till within this year or two, a deſtructive blaſt that has equally affected the tall and hardy timber tree with the tender ſucculent plant: the ſtorm too, no doubt, injured them, their being planted too near each other; and more perhaps than every other cauſe, their not being attended to with that care that the mother tree was: but with all thoſe diſadvantages, the time of producing fruit from the firſt planting, ſeems to be much the ſame, if the dates of the planting and the bearing fruit from the original are exact, which I believe are nearly ſo. How-

ever the tree mentioned in the paper you were pleaſed to leave with me, that was planted at St. Vincent's, muſt have fruited much earlier than theſe at the Guinea*, which, if a fact, muſt proceed from the greater fertility and richneſs of the ſoil of that Iſland than ours.

As it was at your requeſt I have wrote the above, I will make no apology for the rambling prolix way it is written in.

I am,

SIR,

Your obedient and moſt humble ſervant,

ROBERT GIBSON.

JOSHUA STELLE, Eſq.

* The Guinea is the name of a plantation in Barbados.

P. S.

P. S. The girt of the old tree, which is the ſame to the firſt limb that branches off, (to the extremity of which is twenty feet) is five feet ſix inches; the length of the trunk to the above limb, two feet. Six inches above the firſt limb, the trunk divides itſelf into five large branches which are nearly equal in ſize to the lowermoſt, the girt being from two feet eight inches to three feet three inches; the trunk of the largeſt and moſt thriving of the young trees, is in length two feet. The girt at the bottom, two feet ſix inches. Where the firſt limb branches off, which is two feet from the bottom, the girt is two feet ſix inches; the girt of the limb, one foot two inches. Two feet higher, the tree divides into two limbs: their girt is one foot each. The limbs of the old tree ſpread near twenty feet each way from the body of the tree.

SIR,

Mr. MOE, mentioned in Mr. Gibſon's account, was chief manager on Kendall's and Hallet's, for thirty years, and went from thence to the Guinea, in 1773, as Mr. Walker, the then poſſeſſor, had been married to his daughter. Mr. Gibſon is the preſent manager on the Guinea, and was brought up under or with Mr. Moe, and has been intimately connected with him and Mr. Walker, and in the clear knowledge of all theſe circumſtances relating to theſe trees.

Theſe trees are now growing in ſeveral different parts of the Iſland, propagated from the original at the Guinea.

JOSHUA STEELE.

*Barbados,*
*May* 20, 1785.

Mr. MORE.

*The*

*The Thanks of the Society were given to Mr.* GEORGE WILSON, *of* Henrietta Street, Covent Garden, *for a Leaf of the true Cinnamon from Jamaica, preſented by him; and for the following Letter on the ſame ſubject.*

SIR,

I AM ſorry I cannot give you a more methodical hiſtory of the Cinnamon Tree, as I am afraid my mutilated intelligence will hardly prove ſatisfactory.—The leaf I gave you, which is certainly the true leaf of the Laurus Cinnamomi, I received from Dr. Dancer, an ingenious naturaliſt and phyſician, who was ſettled ſome years at Bath, in Jamaica, and is lately come over for the recovery of his health: he procured it from one of thoſe plants which were taken by Lord Rodney in the courſe of the laſt war, on board a French Eaſt-Indiaman, and by him preſented to the Governor of Jamaica. The

Doctor tells me that they thrive very well in that Iſland, and had bloſſomed repeatedly, but had not been known to fructify when he came away. He has ſince been informed they have borne fruit; ſo that we have a fair proſpect of that valuable plant being in a few years cultivated in moſt of the Weſt-India iſlands.—I have the pleaſure alſo to inform you that by the favour of Lord Rodney, and his fortunate capture, the inhabitants of Jamaica are in poſſeſſion of the true Nankeen Cotton, which bears naturally the colour of Nankeen, and is now manufactured at Glaſgow, with a moſt promiſing proſpect of ſucceſs.

I am, SIR,

Your very humble ſervant,

G. WILSON.

*Henrietta Street,*
Nov. 18, 1785.

Mr. MORE.

RE-

# REWARDS

ADJUDGED BY THE

# SOCIETY,

IN

M,DCC,LXXXV.

# REWARDS

BESTOWED IN

# AGRICULTURE.

Claſs 13. TO THOMAS WHITE, Eſq. for planting in 1784 10,000 Engliſh Elm, on his eſtate at Butsfield, in the pariſh of Lancheſter, Durham, the GOLD MEDAL. See the account, page 5.

Claſs 61. To Mr. THOMAS ROBINS, for cultivating Turnep-rooted Cabbage, the GOLD MEDAL. See the account, page 19.

Claſs 94. To Mr. JOHN HARRIOT, for gaining land from the ſea, the GOLD MEDAL. See the account, page 44.

POLITE

## POLITE AND LIBERAL ARTS.

Claſs 117. HONORARY PREMIUM, to MISS AUGUSTA SMITH, Great George-Street, Weſtmiſter, the GOLD MEDAL. Subject, INNOCENCE FLYING TO POWER FOR PROTECTION.

Claſs 118. HONORARY PREMIUM, to MISS BLACKWOOD, the SILVER MEDAL. Subject, HAGAR.

This Premium, Miſs Blackwood declined receiving.

TO MISS MARY ENGLISH, Shooter's Hill, for a Drawing in Pen and Ink, the SILVER MEDAL, gilt. Subject, AN HERMIT.

TO MISS MARGARETTA ELIZABETH WILSON, Charlton-Houſe, Kent, for a Drawing, the SILVER MEDAL. Subject, PENSIVE SHEPHERDESS.

Claſs

Claſs 122. To Mr. WILLIAM PALMER, N° 14, Mercer-Street, Long Acre, the SILVER MEDALLION, given in conformity to the will of JOHN STOCK, Eſq. for a Drawing of the Statues of MARS and VENUS, after the Models by JOHN BACON, Eſq. R. A.

Claſs 127. To Mr. SAMUEL BUNCE, Kirby-Street, Hatton-Street, the GREATER SILVER PALLET, for a Drawing of Machines in perſpective. Subject, PIEDMONT SILK-REEL.

Claſs 128. To MISS CATHARINE CHARLOTTE RAPER, Chelſea, the LESSER SILVER PALLET, for drawing of Beaſts. Subject, COWS AND SHEEP FROM THE LIFE.

Claſs

Claſs 130. To Mr. JOHN WILLIAM LEWIN, N° 186, Fleet-Street, the LESSER SILVER PALLET, for drawing of Birds. Subject, A PIGEON AND SMALL BIRDS FROM THE LIFE.

Claſs 132. To MISS MARTHA TAYLOR, at Mr. Taylor's, Little Earl-Street, Seven Dials, the GREATER SILVER PALLET, for drawing of Flowers, Plants, &c. Subject, A VASE WITH FLOWERS.

Claſs 133. To MISS ELIZABETH HUNTLY, N° 146, Leadenhall-Street, the LESSER SILVER PALLET, for drawing of Flowers, Plants, &c. Subject, A BOUQUET OF FLOWERS.

Claſs 136. To Mr. THOMAS KIRK, N° 146, Berwick-Street, St. James, the

the GREATER SILVER PALLET, for hiſtorical Drawings. Subject, THE JUDGMENT OF PARIS.

To Mr. THOMAS GRENVILLE, the SILVER MEDAL, for the Improvement on his Machine for TEACHING BLIND PERSONS ARITHMETIC. See the account, page 129.

## MANUFACTURES.

To MISS HENRIETTA RHODES, of Cann Hall, near Bridgnorth, Shropſhire, FOR BREEDING SILK-WORMS, the SILVER MEDAL.

## MECHANICKS.

Claſs 146. To Mr. ALEX. MITCHELL, Harpooner on board the ſhip Earl of Chatham, Mr. Wm. Brown Commander, for ſhooting a Whale with the Gun Harpoon, Two GUINEAS.
See the account, page 179.

Claſs 146. To Mr. ROBERT ANDERSON, Spikeneer on board the ſhip Mary Anne, Mr. Charles Patterſon Commander, for ſhooting a Whale with the Gun Harpoon, Two GUINEAS.
See the account, page 182.

To Mr. SAMUEL BUNCE, for a new-conſtructed WHEEL CRANE, the SILVER MEDAL.
See the account, page 183.

To

To Mr. JOHN ADAMS, for his invention of AN ARTIFICIAL HORIZON TO BE USED ON LAND, the SILVER MEDAL. See the account, page 202.

To Mr. JOHN JONES, for his MODEL OF A CALLENDER, TEN GUINEAS.

TWENTY GUINEAS were adjuged to Mr. MORRIS, of Greenwich, for his new-invented WINDOW-SHUTTERS; but he afterwards taking out a patent for them, could not receive this bounty.

# PRESENTS

RECEIVED BY THE

# SOCIETY,

In the YEAR MDCC.LXXXV.

With the Names of the DONORS,

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## BOOKS, &c.

### JAMES BARRY, ESQ.

AN account of a Series of Pictures in the Great Room of the Society of Arts, Manufactures, and Commerce, at the Adelphi; by James Barry, Esq. R. A. Profeſſor of Painting to the Royal Academy,

demy. See an account and deſcription of theſe Pictures, Vol. 3d, page 103—136.

Mr. J. BAVERSTOCK.

Hydrometical Obſervations and Experiments in the Brewery, dedicated to the Society by Mr. J. Baverſtock, with an Appendix.

Meſſrs. ECKARTS.

A paper intitled, Succinct Account of the advantages of Mills, with inclined float board Wheels.

A paper intitled, Account of a Machine for deepening Channels of Rivers, &c.

THE SOCIETY OF ARTS, MANUFACTURES, &c. at Dublin.

A Copy of their Charter.

A Liſt of the Premiums offered by them in 1785.

JOSHUA STEELE, ESQ. Bardados.

A copy of the abridged Minutes of the Society of Arts, &c. at Barbados.

Mr. RICHARD SAMUEL.

The Marquis of Worceſter's Century of Inventions, duodecimo, printed in 1746.

ARTHUR YOUNG, ESQ.

Annals of Agriculture, the IId and IIId Volumes.

Mr. JOHN RICHARDSON.

Theoretic Hints on an improved practice of brewing Malt Liquors, &c. by Mr. John Richardſon.

Mr. EDMUND LEACH.

A Treatiſe of univerſal Inland Navigation, and the uſe of all ſorts of Mines, by Edmund Leach.

Mr.

Mr. WILLIAM THOMAS.

A Volume in folio, intitled, Original Deſigns in Architecture, by Wm. Thomas.

Mr. THOMAS STONE.

An Eſſay on Agriculture, by Mr. Thomas Stone.

## PICTURES AND PRINTS.

Mr. WILLIAM HINCKS.

A ſet of twelve Prints, repreſenting the proceſs of the Linen Manufactory of Ireland, in all its different ſtages, with perſpective views of the principal Machines in uſe, drawn on the ſpot, by William Hincks.

RICHARD COSWAY, ESQ. R. A.

A Portrait of Mr. William Shipley, the founder of the Society, by Richard Coſway, Eſq. R. A.

## MISCELLANEOUS ARTICLES.

By Lewis Montolieu, Esq.

A pair of Spaniſh ſhoes made of canvas and rope.

William Whitmore, Esq.

A model of a machine for threſhing Corn.

Mr. Grenville.

A ſmall board with holes and pegs, which gave Mr. Grenville the firſt idea of the power of numbers: ſee his letter, page 129.

The honourable Directors of the East-India Company.

A quantity of Hemp-ſeed and Flax-ſeed, from China, together with ſome Hemp in the rough ſtate alſo from China. See page 32.

Mr. Thomas March, of Highworth.

A Clock.

Mr.

Mr. EDMUND LEACH.

A model ſhewing a method propoſed for conveying boats from one canal to another, in inland navigation.

JOSHUA STEELE, ESQ.

A bag uſed uſed by the inhabitants of Barbados, for ſqueezing the Caſſava pulp.

NATH. BAYLES, of Newcaſtle, ESQ.

A triangular bearded Harpoon. This is the Harpoon mentioned in Vol. II. p. 222: and with it ſeveral certificates of the uſe of this kind of Beard to Harpoons, were received, ſetting forth the advantages this form has over thoſe in common uſe.

Mr. JOHN AILWAY.

A model of a temporary Barn for ſecuring corn or hay ricks, during the making. See his letter, page 197.

*As all preſents received by the Society, are carefully preſerved in the Repoſitories, they may be examined by the Publick, on application to the proper Officer.*

# A CATALOGUE

OF THE

# MODELS AND MACHINES

*Received ſince the publication of the Third Volume of the Society's Tranſactions, with the numbers as they are aranged in the claſs to which they belong.*

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## AGRICULTURE. CLASS I.

LXIV. A MODEL of a machine for Threſhing Corn, preſented by William Whitmore, Eſq.

LXV. A model of a temporary Barn for ſecuring Corn or Hay Ricks during

during the making, preſented by Mr. Ailway.

MANUFACTURES. CLASS III.

XXI. A pair of Spaniſh Shoes, made of Canvas and Rope, preſented by Lewis Montolieu, Eſq.

XXII. A quantity of Hemp and Flax Seed, from China, together with ſome Hemp in the rough ſtate, alſo from China, preſented by the honourable the Directors of the Eaſt-India Company.

XXIII. A Caſſava Bag preſented by Joſhua Steel, Eſq.

MECHANICKS. CLASS IV.

XCVI. A model of a Calender by Mr. John Jones, for which he had a bounty of Ten Guineas.

XCVII. A model, ſhewing a method propoſed for tranſporting Boats from one canal to another in inland navigation, preſented by Mr. Edmund Leach.

XCVIII. A Triangular Bearded Harpoon (this is the Harpoon mentioned in Vol. 2. page 222): and with it, ſeveral certificates of the uſe of this kind of beard to Harpoons were received, ſetting forth the advantage this form has over thoſe in common uſe, preſented by Nathaniel Bayles, of Newcaſtle, Eſq.

XCIX. A ſmall Board with Holes and Pegs, which gave Mr. Grenville the firſt idea of the power of numbers, preſented by Mr. Grenville. See his letter, page 129.

C. A Clock preſented by Mr. Thomas March, of Highworth.

A LIST

# A LIST

## OF THE

# OFFICERS OF THE SOCIETY,

## And CHAIRMEN

## OF THE SEVERAL

# COMMITTEES.

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PRESIDENT.

**ROBERT Lord Romney, LL. D. F. R. S.

VICE-PRESIDENTS.

**Charles Duke of Richmond, &c. F. R. S.
**Hugh Duke of Northumberland, F. R. S.
**Jacob P. Earl of Radnor
**Hugh Earl Percy
**Hon. Charles Marſham, F. R. S.

Sir

MECHANICKS.

Joſeph Hurlock, Eſq. F. R. S.
Samuel Ewer, Eſq.

CHEMISTRY, &c.

Mr. Kendrick.
Dr. Jackſon.

COLONIES AND TRADE.

Mr. John Samuel.
Mr. Zurhorſt.

MISCELLANEOUS MATTERS.

Mr. Jacob.
Mr. Abraham Hall.

A LIST

# PREMIUMS

OFFERED BY THE

# SOCIETY

FOR THE ENCOURAGEMENT OF

# ARTS, MANUFACTURES,

AND

# COMMERCE,

IN THE

YEAR MDCCLXXXVI.

TO THE

# PUBLICK.

ADELPHI-BUILDINGS, *April* 12, 1786.

THE chief objects of the attention of the Society for the encouragement of Arts, Manufactures, and Commerce, in the application of their Rewards, are Ingenuity in the ſeveral branches of the Polite and Liberal Arts; uſeful diſcoveries and improvements in AGRICULTURE, MANUFACTURES, MECHANICKS, and CHEMISTRY, or the laying open any ſuch to the Publick; and, in general, all ſuch uſeful inventions, diſcoveries, or improvements (though not mentioned in the Book of Premiums), as may appear to have a tendency to the advantage of Trade and Commerce. The Society therefore, in purſuance of their plan, propoſe to beſtow the following premiums.

*Premiums*

*Premiums for Planting and Huſbandry.*

1. ACORNS. For ſetting or ſowing the greateſt quantity of land, not leſs than ten acres, with acorns, between the firſt day of October, 1785, and the firſt of January, 1786; and for fencing and preſerving the ſame effectually, in order to raiſe timber; the gold medal.

2. For the ſecond greateſt quantity of land, not leſs than five acres, ſet or ſown with acorns, agreeably to the above conditions; the ſilver medal.

CERTIFICATES of the ſetting or ſowing agreeably to the above conditions; and that there are not fewer than one thouſand plants on each acre, to be produced to the Society, on or before the firſt Tueſday in November, 1786.

3, 4. The ſame premiums are extended one year further; certificates to be produced

duced on or before the firſt Tueſday in November, 1787.

5. RAISING OAKS. To the perſon who ſhall raiſe the greateſt number of oaks, not fewer than five thouſand, either from young plants, or from acorns, in woods, parks, or foreſts, that have long been under timber, and effectually fence and preſerve the ſame, in order to ſecure a ſucceſſion of oak timber in this kingdom; the gold medal.

6. For the next greateſt quantity, not fewer than three thouſand; the ſilver medal.

CERTIFICATES and accounts to be produced on or before the firſt Tueſday in January, 1788.

7, 8. The ſame premiums are extended one year further.

CERTIFICATES to be produced on or before the firſt Tueſday in January, 1789.

9, 10. The ſame premiums are extended one year further.

CERTIFICATES to be produced on or before the firſt Tueſday in January, 1790.

11. CHESNUTS. For ſetting or ſowing the greateſt quantity of land, not leſs than ſix acres, with Spaniſh Cheſnuts, before the firſt day of May, 1786, and for effectually fencing and preſerving the ſame, in order to raiſe timber; the gold medal.

12. For the ſecond greateſt quantity, not leſs than four acres; the ſilver medal.

13. For the third greateſt quantity, not leſs than two acres; the ſilver medal.

CERTIFICATES of ſetting or ſowing agreeably to the above conditions (and that there are twelve hundred Spaniſh Cheſnut plants, at leaſt, on each acre) muſt be delivered to the Society on or before the firſt Tueſday in November, 1786.

14, 15, 16. The like premiums will be given for ſetting or ſowing Spaniſh Cheſnuts before the firſt of May, 1787.

CER-

CERTIFICATES to be delivered on or before the firſt Tueſday in November, 1787.

17. ELM. For planting the greateſt number of the Engliſh Elm, not leſs than eight thouſand, between the twenty-fourth of June, 1785, and the twenty-fourth of June, 1786, and for the effectually fencing and preſerving the ſame, in order to raiſe timber; the gold medal.

18. For the ſecond greateſt number, not leſs than five thouſand; the ſilver medal.

19. For the third greateſt number, not leſs than four thouſand; the ſilver medal.

CERTIFICATES of having planted agreeably to the above conditions, and ſpecifying the diſtance of the trees, muſt be delivered to the Society, on or before the firſt Tueſday in November, 1786.

20, 21, 22. The ſame premiums are extended one year further.

CERTIFICATES to be delivered on or before the firſt Tueſday in November, 1787.

23. LARCH. For planting out, from the twenty-fourth of June, 1785, to the twenty-fourth of June, 1786, at a diſtance not more than five feet, the greateſt number of Larch-trees, not leſs than five thouſand; the plants to be between two and four years old when planted out; and for effectually fencing and preſerving the ſame, in order to raiſe timber; the gold medal.

24. For the ſecond greateſt number, not leſs than three thouſand; the ſilver medal.

CERTIFICATES of planting according to the above conditions to be delivered on or before the laſt Tueſday in November, 1786.

25, 26. The like premiums will be given on the ſame conditions, for planting out

out Larch-trees, between the twenty-fourth of June, 1786, and the twenty-fourth of June, 1787.

CERTIFICATES to be produced on or before the laſt Tueſday in November, 1787.

27. HUNTINGDON WILLOW. For the greateſt number of acres, not leſs than three, planted in the year 1786, with Huntingdon Willows; the number of cuttings to be at leaſt one thouſand on each acre, properly fenced and ſecured; the gold medal.

CERTIFICATES to be produced on or before the laſt Tueſday in December, 1786.

28. The ſame premium is extended one year further.

CERTIFICATES to be produced to the Society on or before the laſt Tueſday in December, 1787.

29. ALDER. For the greateſt number of acres, not leſs than ſix, planted in the year 1785, with Alders, to be at leaſt one thouſand on each acre, properly fenced and ſecured.

CERTIFICATES to be produced to the Society, on or before the laſt Tueſday in December, 1786, of the ſaid planting, and that the trees were then growing on the land; the gold medal.

30. The ſame premium is extended one year further.

CERTIFICATES to be produced on or before the laſt Tueſday in December, 1787.

31. UPLAND OR RED WILLOW. For the greateſt number of acres, not leſs than three, planted before the end of April, 1786, with Upland or Red Willow, properly fenced and ſecured; the number of

plants

plants on each acre to be at leaſt twelve hundred; the gold medal.

CERTIFICATES to be produced on or before the laſt Tueſday in April, 1787.

It is well known that this ſpecies of Willow thrives well on dry ſandy land.

32. The ſame premium is extended one year further.

CERTIFICATES to be produced on or before the laſt Tueſday in April, 1788.

33. ASH. For planting the greateſt number of acres, not leſs than ſix, in the year 1786, with Aſh for timber; the plants to be at leaſt two years old, properly ſecured and fenced; the number of plants on each acre to be at leaſt twelve hundred; the gold medal.

34. For the next greateſt number of acres, not leſs than four; the ſilver medal.

CERTIFICATES to be delivered on or before the ſecond Tueſday in December, 1787.

35, 36. The ſame premiums are extended one year further.

CERTIFICATES to be delivered on or before the ſecond Tueſday in December, 1788.

37. MIXED TIMBER TREES. To the perſon who ſhall encloſe, and plant or ſow the greateſt number of acres, not leſs than ten, with the beſt ſorts of Foreſt Trees, for timber, between the firſt of October, 1784, and the firſt of May, 1786, and ſhall deliver to the Society an account of the methods uſed in making the plantations, and of the nature of the ſoil, together with proper Certificates that the trees are then in a thriving condition on the land; the gold medal.

The

The Accounts and Certificates to be produced to the Society on or before the firſt Tueſday in November, 1788.

38. The ſame premium is extended one year further.

Accounts and Certificates to be produced on or before the firſt Tueſday in November, 1789.

39. The ſame premium is extended one year further.

Accounts and Certificates to be produced on or before the firſt Tueſday in November, 1790.

40. MULBERRY CUTTINGS. For raiſing the greateſt number of white or black Mulberry-Trees, for feeding Silk-worms, not leſs than three hundred, from cuttings, in the year 1785, the gold medal.

CER-

CERTIFICATES of the raiſing and growth, with the manner of culture, and that the plants were growing in September, 1778, to be produced on or before the firſt Tueſday in November, 1788.

41. MULBERRY CUTTINGS. To the perſon who ſhall form, in the year 1785, the largeſt plantation, not leſs than one acre, of Mulberry Cuttings for the purpoſe of feeding Silk-worms; the gold medal.

CERTIFICATES of the quantity of land, and the method of culture, that the Mulberry-Plants are not more than three feet aſunder, and that they were growing in the month of September, 1788, to be produced on or before the firſt Tueſday in December, 1788.

It is propoſed that this plantation be continually kept in a low ſtate, to the intent that the gathering the leaves may always

always be within the reach of women and children.

*** *The Candidates for planting all kinds of trees, are to certify, that the reſpective plantations are properly fenced and ſecured, and particularly to ſtate the condition the plants were in at the time of ſigning ſuch Certificates,*

*Any information which the Candidates for the foregoing premiums may chooſe to communicate, relative to the methods made uſe of in forming the plantations, or promoting the growth of the ſeveral trees, or any other obſervations that may have occurred on the ſubject, will be thankfully received.*

42. TREES FOR USE WHEN EXPOSED TO THE WEATHER. To the perſon who ſhall ſend the moſt ſatisfactory account, verified by experiments, to determine which of the following trees is of the greateſt utility for timber or poles,

CERTIFICATES of the raiſing and growth, with the manner of culture, and that the plants were growing in September, 1778, to be produced on or before the firſt Tueſday in November, 1788.

41. MULBERRY CUTTINGS. To the perſon who ſhall form, in the year 1785, the largeſt plantation, not leſs than one acre, of Mulberry Cuttings for the purpoſe of feeding Silk-worms; the gold medal.

CERTIFICATES of the quantity of land, and the method of culture, that the Mulberry-Plants are not more than three feet aſunder, and that they were growing in the month of September, 1788, to be produced on or before the firſt Tueſday in December, 1788.

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CERTIFICATES of the quantity of land, and the method of culture, that the Mulberry-Plants are not more than three feet aſunder, and that they were growing in the month of September, 1788, to be produced on or before the firſt Tueſday in December, 1788.

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CERTIFICATES of the raiſing and growth, with the manner of culture, and that the plants were growing in September, 1778, to be produced on or before the firſt Tueſday in November, 1788.

41. MULBERRY CUTTINGS. To the perſon who ſhall form, in the year 1785, the largeſt plantation, not leſs than one acre, of Mulberry Cuttings for the purpoſe of feeding Silk-worms; the gold medal.

CERTIFICATES of the quantity of land, and the method of culture, that the Mulberry-Plants are not more than three feet aſunder, and that they were growing in the month of September, 1788, to be produced on or before the firſt Tueſday in December, 1788.

It is propoſed that this plantation be continually kept in a low ſtate, to the intent that the gathering the leaves may always

always be within the reach of women and children.

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42. TREES FOR USE WHEN EXPOSED TO THE WEATHER. To the perſon who ſhall ſend the moſt ſatisfactory account, verified by experiments, to determine which of the following trees is of the greateſt utility for timber or poles,

CERTIFICATES of the raiſing and growth, with the manner of culture, and that the plants were growing in September, 1778, to be produced on or before the firſt Tueſday in November, 1788.

41. MULBERRY CUTTINGS. To the perſon who ſhall form, in the year 1785, the largeſt plantation, not leſs than one acre, of Mulberry Cuttings for the purpoſe of feeding Silk-worms; the gold medal.

CERTIFICATES of the quantity of land, and the method of culture, that the Mulberry-Plants are not more than three feet aſunder, and that they were growing in the month of September, 1788, to be produced on or before the firſt Tueſday in December, 1788.

It is propoſed that this plantation be continually kept in a low ſtate, to the intent that the gathering the leaves may always

always be within the reach of women and children.

*** *The Candidates for planting all kinds of trees, are to certify, that the reſpective plantations are properly fenced and ſecured, and particularly to ſtate the condition the plants were in at the time of ſigning ſuch Certificates,*

*Any information which the Candidates for the foregoing premiums may chooſe to communicate, relative to the methods made uſe of in forming the plantations, or promoting the growth of the ſeveral trees, or any other obſervations that may have occurred on the ſubject, will be thankfully received.*

42. TREES FOR USE WHEN EXPOSED TO THE WEATHER. To the perſon who ſhall ſend the moſt ſatisfactory account, verified by experiments, to determine which of the following trees is of the greateſt utility for timber or poles,

CERTIFICATES of the raiſing and growth, with the manner of culture, and that the plants were growing in September, 1778, to be produced on or before the firſt Tueſday in November, 1788.

41. MULBERRY CUTTINGS. To the perſon who ſhall form, in the year 1785, the largeſt plantation, not leſs than one acre, of Mulberry Cuttings for the purpoſe of feeding Silk-worms; the gold medal.

CERTIFICATES of the quantity of land, and the method of culture, that the Mulberry-Plants are not more than three feet aſunder, and that they were growing in the month of September, 1788, to be produced on or before the firſt Tueſday in December, 1788.

It is propoſed that this plantation be continually kept in a low ſtate, to the intent that the gathering the leaves may always

always be within the reach of women and children.

*** *The Candidates for planting all kinds of trees, are to certify, that the reſpective plantations are properly fenced and ſecured, and particularly to ſtate the condition the plants were in at the time of ſigning ſuch Certificates,*

*Any information which the Candidates for the foregoing premiums may chooſe to communicate, relative to the methods made uſe of in forming the plantations, or promoting the growth of the ſeveral trees, or any other obſervations that may have occurred on the ſubject, will be thankfully received.*

42. TREES FOR USE WHEN EXPOSED TO THE WEATHER. To the perſon who ſhall ſend the moſt ſatisfactory account, verified by experiments, to determine which of the following trees is of the greateſt utility for timber or poles,

poles, for uſe when expoſed to the weather, viz.

| | |
|---|---|
| Larch, | Black-Poplar, |
| Aſh, | Spaniſh-Cheſnut, |
| Willow, | Alder, |
| Lombardy-Poplar, | |

The gold medal.

The Accounts to be produced on or before the ſecond Tueſday in December, 1786.

43. The ſame premium is extended one year further.

The Accounts to be produced on or before the ſecond Tueſday in December, 1787.

44. PRESERVING ACORNS. To the perſon who ſhall produce to the Society the moſt effectual method of preventing Acorns, when ſown or planted for timber, being injured by Mice; the gold medal.

The

The Accounts, verified by actual experiments, with proper Certificates that the methods made uſe of have been fully ſufficient for the purpoſe, to be produced on or before the laſt Tueſday in November, 1786.

45. PRESERVING CHESNUTS, and SEEDS of other FOREST TREES. To the perſon who ſhall produce to the Society, the moſt effectual method of preventing Cheſnuts, and the Seeds of other Foreſt Trees, when ſown or planted for Timber, being deſtroyed by Mice; the ſilver medal.

The Accounts, verified by actual experiments, with proper Certificates that the methods made uſe of have been fully ſufficient for the purpoſe, to be produced on or before the laſt Tueſday in November, 1786.

46. PLANTING BOGGY OR MORASSY SOILS. For an account of the beſt

beſt ſet of experiments ſent by the planter, or his repreſentative, to aſc rtain the comparative advantages of planting boggy or moraſſy ſoils, with White Poplar, Black Poplar, Lombardy Poplar, and Willow; the gold medal.

It is required that not leſs than half an acre be planted with each, and the plants to be not more than four feet aſunder.

It is alſo required that the plantation ſtand fourten years; at the end of which, to be all cut down and meaſured, or accurately meaſured ſtanding; the Certificates of the meaſure and value, and that the whole is properly fenced and ſecured, to be produced on or before the firſt Tueſday in January, 1792.

N. B. Any information relating to the ſtate of the plantation, if ſent to the Society, between the time of planting and claiming the premium, will be thankfully received.

47. The

47. The ſame premium is extended one year further.

CERTIFICATES to be produced on or before the firſt Tueſday in January, 1793.

48. The ſame premium is extended one year further.

CERTIFICATES to be produced on or before the firſt Tueſday in January, 1794.

49. The ſame premium is extended to the year 1796.

CERTIFICATES to be produced on or before the firſt Tueſday in January, 1797.

50. The ſame premium is extended one year further.

CERTIFICATES to be produced on or before the firſt Tueſday in January, 1798.

51. ROOTS OF CORN. To the perſon who ſhall aſcertain from obſervation, and by experiment, the ſucceſſion of the differ-

different Roots of Corn (diſtinguiſhing the times when ſuch ſucceſſion of roots takes place), particularly thoſe which ſhoot out at or near the time the plants go into ear; ſhewing alſo from facts, the injury ariſing from the failure of thoſe particular roots, and the moſt effectual means of preventing ſuch misfortune; the gold medal.

To be produced on or before the firſt Tueſday in January, 1787.

52. The ſame premium is extended one year further. Accounts to be delivered on or before the firſt Tueſday in January, 1788.

N. B. Theſe premiums are extended to Scotland and Ireland.

53. COMPARATIVE CULTURE OF WHEAT. For the beſt ſet of experiments on not leſs than ſix acres of land, to aſcertain whether it is moſt advantageous to cultivate Wheat, by ſowing

ing it in the common broad-caſt way, by drilling it in equi-diſtant rows, or by dibbling, hoeing the intervals; the gold medal.

It is required that the diſtance between the rows may not exceed eleven inches, and that an account of the nature and condition of the land on which the experiments are made, together with an account of the produce of the Corn, be produced to the Society, on or before the firſt Tueſday in February, 1787.

54. The ſame premium is extended one year further.

The Accounts to be produced to the Society, on or before the firſt Tueſday in February, 1788.

55. BEANS AND WHEAT. To the perſon who ſhall plant or drill, between the firſt of December, 1785, and the firſt of March, 1786, the greateſt quantity of

land, not leſs than ten acres, with Beans, and ſhall ſow the ſame land with Wheat in the ſame year, 1786; ten guineas.

It is required that an account of the ſort and quantity of Beans, the time of planting or drilling, and of reaping or mowing them, the produce per acre threſhed, the application of the ſtraw, the expence of planting or drilling, hand or horſe hoeing, the diſtance of rows and the quality of the ſoil, together with Certificates of the number of acres, and that the land was actually ſown with Wheat in the year 1786, be produced on or before the firſt Tueſday in November, 1787.

N. B. The Society have been informed that Beans may be drilled or planted ſo early as the month of December; from whence may be derived the advantage of an early harveſt; in which caſe, the ſtraw will be far more valuable than that from a latter planting or drilling.

56. The

56. The ſame premium is extended one year further. The Accounts to be produced on or before the firſt Tueſday in November, 1788.

57. TURNEPS. For the beſt account of experiments made on at leaſt ſix acres of land, to determine the comparative advantages of the drill or broad-caſt method, in the cultivation of Turneps; ten guineas.

The Accounts to be delivered in, on or before the third Tueſday in April, 1787.

58. TURNEPS. For the beſt account of experiments made on at leaſt ſix acres of land, to determine the comparative advantages of the drill or broad-caſt method in the cultivation of Turneps; the gold medal.

The Accounts to be delivered in, on or before the third Tueſday in April, 1788.

59. The ſame premium is extended to the year 1788.

The Accounts to be delivered on or before the third Tueſday in April, 1789.

60. GREEN VEGETABLE FOOD. For the beſt account, confirmed by experiments, of the vegetable Food (Cabbages and Turneps excepted) growing in the months of March and April, that will moſt increaſe the milk in mares, cows, and ewes, at that ſeaſon; provided ſuch food can be cultivated at an expence that will admit of its being applied to the above purpoſes; the gold medal.

CERTIFICATES to be produced on or before the ſecond Tueſday in November, 1786.

61. The ſame ſame premium is extended one year further.

CERTIFICATES to be produced on or before the ſecond Tueſday in November 1787.

62. TURNEP-ROOTED CABBAGE. For raiſing, and having duly cultivated Turnep-rooted Cabbage, in the year 1784, for the feeding cattle or ſheep, on the greateſt

greateſt number of acres, not leſs than ten, and giving an account of the ſoil, culture, time and manner of feeding off, produce, and the effects on cattle or ſheep fed with it; the gold medal.

63. For the next greateſt number of acres, not leſs than five; the ſilver medal.

CERTIFICATES of the quantity of land, with the accounts, to be produced on or before the laſt Tueſday in October, 1786.

64. TURNEP-ROOTED CABBAGE. For raiſing and having duly cultivated Turnep-rooted Cabbage, in the year 1785, for the feeding cattle or ſheep on the greateſt number of acres, not leſs than ten, and giving an account of the ſoil, culture, time, and manner of feeding off, produce, and the effects on cattle or ſheep fed with it; ten guineas.

65. For the next greateſt number of acres, not leſs than five; five guineas.

CERTIFICATES of the quantity of Land, with the accounts, to be produced on or before the laſt Tueſday in October, 1787.

66. CULTIVATING ROOTS AND HERBAGE FOR FEEDING SHEEP AND BLACK CATTLE. For the moſt ſatisfactory experiments made between Michaelmas, 1786, and the firſt of May, 1787, in order to aſcertain which of the following plants can be cultivated and houſed, or otherwiſe ſecured for winter fodder, to the greateſt advantage, viz.

| | |
|---|---|
| Turnep-rooted Cabbage, | Carrots, |
| Turnep Cabbage, | Parſneps, |
| Turneps, | Potatoes. |

The Accounts to be produced on or before the firſt Tueſday in November, 1787; the gold medal.

It is required that the above roots be taken off the land by the laſt day of October,

tober, 1786; that a Crop of Wheat may be ſown in the ſame ground, and the particulars of the ſowing and planting, taking up, produce, preſerving, and application to the feeding Sheep and Black Cattle, be ſpecified. The comparative experiments muſt be made between two or more of any of the above-mentioned plants, and not leſs than two acres be cultivated with each particular kind of plant.

N. B. Great advantage will ariſe to the Farmer occupying land in the neighbourhood of extenſive commons, from the conveniency of keeping large flocks of ſheep, and herds of cattle, if the difficulty of ſupporting them through the winter was obviated by a due knowledge of this practice.

67. The ſame premium is extended one year further.

CERTIFICATES to be produced on or before the firſt Tueſday in November, 1788.

68. MANAGING BEES. To the perſon who ſhall produce to the Society the moſt ſatisfactory account, verified by experiments, of Managing Bees to the greateſt advantage in this climate; the gold medal.

To be produced on or before the ſecond Tueſday in January, 1787.

69. CULTIVATING THE TRUE RHUBARB. For raiſing, before the end of the year 1786, the greateſt number of plants, not leſs than three hundred, of Rheum Palmatum, or true Rhubarb; the gold medal.

70. For the next greateſt quantity, not leſs than two hundred plants; the ſilver medal.

CERTIFICATES of the number of plants, that they ſtand at leaſt four feet aſunder, that they have been in a thriving ſtate during the preceding ſummer, with an account of the ſoil, culture, and aſpect,

to

to be produced on or before the ſecond Tueſday in February, 1787.

71, 72. The ſame premiums are extended one year further.

CERTIFICATES to be produced on or before the ſecond Tueſday in February, 1788.

73. RHUBARB. For the greateſt quantity of Rhubarb of Britiſh growth, not leſs than twenty pounds weight, equal to ſuch as is commonly ſold in the ſhops, under the name of Turkey, or Ruſſia Rhubarb; five pounds of which to be produced as a ſample, with certificates that the remainder is of equal goodneſs, and a particular account of the manner of culture, and cure, on or before the firſt Tueſday in November, 1786; the gold medal.

74. For the next greateſt quantity, not leſs than ten pounds weight; the ſilver medal.

75, 76.

75, 76. The ſame premiums are extended one year further. The ſamples and certificates to be produced on or before the firſt Tueſday in November, 1787.

77. ASCERTAINING THE COMPONENT PARTS OF ARABLE LAND. To the perſon who ſhall produce to the Society the moſt ſatisfactory ſet of experiments, to aſcertain the due proportion of the ſeveral component parts of Arable Land, in one or more counties in Great Britain, by an accurate analyſis of it, and who, having made a like analyſis of ſome poor land, ſhall, by comparing the component parts of each, and thereby aſcertaining the deficiencies in the poor ſoil, improve a quantity of it, not leſs than two acres, by the addition of ſuch parts as the former experiments ſhall have diſcovered to be wanting therein, and therefore probably the cauſe of its ſterility; the gold medal.

It is required that the manurings, ploughings, and crops of the improved land, be the ſame after the improvement as before, and that a minute account of the produce in each ſtate, of the weather, and of the various influencing circumſtances, together with the method made uſe of in analyſing the ſoils, be produced, with proper certificates, and the chymical reſults of the analyſis, which are to remain the property of the Society, on or before the laſt Tueſday in November, 1788.

It is expected that a quantity, not leſs than ſix pounds, of the rich, of the poor, and of the improved ſoils, be produced with the certificates.

N. B. Among the methods or proceſſes made uſe of by Chymiſts, and called *dry* or *moiſt*, the latter only appears adapted to the aſcertaining the reſpective proportions of the component parts of arable earth.—Dr. Shaw, in his Chymical Lectures.

tures—Dr. Home, in his principles of Agriculture—Dr. George Fordyce, in his Elements of Agriculture, and Sir Torbern Bergman, in his *Diſſertation ſur les Terres Géoponiques*, have treated of theſe ſubjects.

78. The ſame premium is extended one year further; the accounts to be produced on or before the laſt Tueſday in November, 1789.

79. The ſame premium is extended one year further; the accounts to be produced on or before the laſt Tueſday in November, 1790.

80. The ſame premium is extended one year further; the accounts to be produced on or before the laſt Tueſday in November, 1791.

81. IMPROVING LAND LYING WASTE. For the beſt account of a method of improving any of the following ſoils, being land lying waſte or uncultivated, viz.

viz. Clay, Gravel, Sand, Chalk, Moor, or Peat-earth, and Bog; verified by experiments on not leſs than ten acres of land, to be produced on or before the ſecond Tueſday in December, 1786; the gold medal for each.

82. For the next in merit, the ſilver medal.

The ſoil, manner of improvement, expence, and product, are required to be fully explained.

83, 84. The ſame premiums are extended one year further.

The accounts to be produced on or before the ſecond Tueſday in December, 1787.

85, 86. The ſame premiums are extended one year further.

The accounts to be produced on or before the ſecond Tueſday in December, 1788.

87. MA-

87. MANURES. To the perſon who ſhall give the moſt ſatisfactory account, verified by accurate experiments, on what ſoil the application of Marle, Chalk, Lime, or Clay, ſeverally, as manures, be moſt beneficial; the gold medal.

It is required that each experiment be made on one acre, and that they be continued four years, the ſame kind of Grain being ſown the ſame year on the ſeveral ſpots.

It is alſo required, that, if different manures are compared, the experiments be made on ſimilar ſoils, lying near each other.

An account of the nature of the ſoil, manure, and the quantity laid on, with all expences and crops, to be delivered, with ſpecimens of the ſoil and manure, on or before the firſt Tueſday in January, 1787.

88. The

88. The ſame premium is extended one year further.

The accounts and ſpecimens to be produced on or before the firſt Tueſday in January, 1788.

89. The ſame premium is extended one year further.

The accounts and ſpecimens to be produced on or before the firſt Tueſday in January, 1789.

90. MANURES. For the moſt ſatisfactory ſet of experiments, to aſcertain the comparative advantage of the following Manures, uſed as Top-Dreſſings, on Graſs or Corn Land, viz. Soot, Coal-Aſhes, Wood-Aſhes, Lime, Night-Soil; the gold medal.

It is required that not leſs than half an acre of land be appropriated to each Manure, the ſoils ſimilar, and lying near each other; and if the Manure be uſed on Corn,

Corn Land, then it is required that the ſame kind of grain be ſown the ſame year on each ſpot: the experiments to be continued not leſs than two years.

An Account of the nature of the Soil, quantity, and expence of the Manure and Crops, with Certificates, to be produced on or before the firſt Tueſday in December, 1787.

91. The ſame premium is extended one year further.

The Account and Certificates to be produced on or before the firſt Tueſday in December, 1788.

92. COURSE OF CROPS ON STRONG LAND. For the moſt ſatisfactory account, verified by experiments, made on not leſs than five acres of Clay, or wet Loam, to aſcertain the advantages of the following courſe of crops, viz. Firſt, Beans drilled, or planted and hoed; Secondly, Wheat; the gold medal.

Theſe

Theſe experiments to be continued two courſes, or four years.

CERTIFICATES, with an account of the Soil, Culture, and quantity of Manure, if any, laid on, to be produced on or before the laſt Tueſday in March, 1788.

N. B. The ſucceſs of this courſe of crops much depending on the land being kept entirely clean, it is expected that each crop of the Beans be horſe-hoed or hand-hoed, at leaſt three times.

93. IMPROVING WASTE MOORS. For the improvement of the greateſt number of acres of Waſte Moor Land, not leſs than one hundred; the gold medal.

It is required that the land, before improvement, be abſolutely uncultivated, in a great meſure uſeleſs, not let to any tenant, and without any building upon it except cottages or huts; that, in its improved ſtate, it ſhall be encloſed, cul-

tivated, and divided into fields, with buildings erected thereon, ſufficient for the uſe and reſidence of a tenant.

CERTIFICATES of the number of acres, of the quality of the Moor ſo improved, of the mode and expence of the improvement, the ſtate it is in as to the proportion of graſs to arable, and the rent at which it is let, to be produced on or before the firſt Tueſday in February, 1787.

94. The ſame premium is extended one year further.

CERTIFICATES to be produced on or before the firſt Tueſday in February, 1788.

95. The ſame premium is extended one year further.

CERTIFICATES to be produced on or before the firſt Tueſday in February, 1789.

96. GAINING LAND FROM THE SEA. To the perſon who ſhall produce to the

the Society, an account of the beſt method, verified by actual experiment, of gaining Land from the Sea, not leſs than twenty acres, on the coaſt of England or Wales; the gold medal.

CERTIFICATES of the quantity of Land, and that the experiments were begun after the firſt of January, 1781, to be produced to the Society on or before the firſt Tueſday in October, 1786.

N. B. The Society have been credibly informed, that land has been gained on the coaſt of Holland, by fixing rows of whiſps of ſtraw upright in the ſand, at about a foot diſtant from each other, or by fixing ſtakes at proper diſtances from each other, and whatling ſtraw-bands between them.

97. The ſame premium is extended one year further.

CERTIFICATES to be produced on or before the firſt Tueſday in October, 1787.

 98. The

98. The ſame premium is extended one year further.

CERTIFICATES to be produced on or before the firſt Tueſday in October, 1788.

99. The ſame premium is extended one year further.

CERTIFICATES to be produced on or before the firſt Tueſday in October, 1789.

100. DRILL PLOUGH FOR HORSE BEANS. For the beſt Drill Plough for Horſe Beans only; being an improvement on thoſe already in the poſſeſſion of the Society, or generally known; to be produced to the Society, on or before the firſt Tueſday in January, 1787; the ſilver medal, or ten guineas.

It is expected the plough be ſtrong and cheap, no variation of depth or diſtance being required.

The

The Plough to which the premium is adjudged, is to become the property of the Society.

101. MACHINE TO ANSWER THE PURPOSE OF REAPING OR MOWING CORN. For inventing a Machine to anſwer the purpoſe of mowing or reaping Wheat, Rye, Barley, Oats, or Beans, by which it may be done more expeditiouſly and cheaper, than by any method now practiſed, provided it does not ſhed the Corn or Pulſe, more than the methods in common practice, and that it lays the ſtraw in ſuch manner as may be eaſily gathered up for binding; ten guineas.

The Machine with Certificates that at leaſt three acres have been cut by it, to be produced to the Society on or before the ſecond Tueſday in December, 1786.

Simplicity, and cheapneſs in the conſtruction, will be conſidered as principal parts of its merit.

102. CURING SCAB IN SHEEP. To the perſon who ſhall diſcover to the Society the moſt efficacious method of curing the diſorder called the *Scab in Sheep*, verified by repeated trials; the ſilver medal, or ten guineas.

CERTIFICATES of the Cure, with an account of the diſeaſe, to be delivered to the Society, on or before the ſecond Tueſday in January, 1787.

103. DESTROYING THE GRUB OF THE COCKCHAFER. To the perſon who ſhall diſcover to the Society an effectual method, verified by repeated and ſatisfactory trials, of deſtroying the Grub of the Cockchafer, ſo deſtructive to the roots of all ſorts of Corn, Peaſe, Beans, and Turneps; the gold medal.

The Accounts to be produced on or before the firſt Tueſday in January, 1787.

*Premiums*

*Premiums for Diſcoveries and Improvements in Chemiſtry, Dying, and Mineralogy.*

104. KELP. For the greateſt quantity, not leſs than four tons of Kelp, containing a much larger proportion of Alkaline Salt than any Kelp now made for ſale; twenty pounds.

A ſpecimen of one hundred weight to be produced on or before the firſt Tueſday in January, 1787; together with Certificates that the whole quantity is equal to the ſpecimen, and made in Great Britain or Ireland, of Sea-Weed.

105. BARILLA. For the greateſt quantity of merchantable Barilla, not leſs than half a ton, made from Spaniſh Kali, raiſed in Great Britain; the gold medal.

A ſample of not leſs than twenty-eight pounds, with a Certificate that half a ton

has been made, to be produced on or before the firſt Tueſday in January, 1787.

106. DISSERTATION ON ALKALI. To the perſon who ſhall compoſe the beſt diſſertation on the nature and qualities of vegetable and mineral Alkali, containing an account of their analogy to each other, and of the moſt eſſential properties wherein they differ; together with any uſeful remarks that may have eſcaped the notice of chemical writers; explaining alſo the means of ſeparating them from each other, but more particularly from ſea ſalt, or other neutral ſalts which are frequently found united with them; ſo that, when purified, they may be advantageouſly uſed in ſuch manufactures wherein the admixture of neutral ſalts is detrimental; laſtly, an inveſtigation into the nature of their compoſition, and the method of decompounding them into their conſtituent principles; the gold medal, or fifty pounds.

The

The diſſertation to be produced to the Society on or before the firſt Tueſday in March, 1787.

107. PRESERVING SEEDS OF VEGETABLES. For the beſt method of preſerving the ſeeds of plants in a ſtate fit for vegetation, a longer time than has hitherto been practiſed, ſuch method being ſuperior to any known to the public, and verified by ſufficient trial; to be communicated to the Society on or before the firſt Tueſday in December, 1786; the gold medal.

108. DESTROYING SMOKE. For the beſt account, aſcertained by proper experiments, of a method of deſtroying or burning the ſmoke of fires belonging to ſteam Engines, Furnaces employed in calcining or ſmelting metals, or other large works, in order to prevent annoyance to the neighbourhood; to be produced on or before the

the firſt Tueſday in January, 1787; the gold medal.

109. SUBSTITUTE FOR OR PREPARATION OF YEAST. For diſcovering to the Society an effectual Subſtitute for Yeaſt, or Preparation of Yeaſt, for fermenting liquors, and raiſing bread that may be preſerved for uſe, better than any hitherto generally known; the gold medal, or twenty pounds.

Specimens of the Subſtitute, or of the Preparation of Yeaſt, ſufficient for trials, together with a paper ſealed up, and containing an account of the compoſition of the Subſtitute, or method of preparing the Yeaſt, to be produced on or before the laſt Tueſday in November, 1786.

110. INCREASING STEAM. To any perſon who ſhall diſcover to the Society, a method verified by actual experiments, of increaſing the quantity, or the force of Steam,

Steam, in Steam Engines, with leſs fuel than is uſually employed, provided that in general the whole amount of the expences in uſing Steam Engines may be conſiderably leſſened; the gold medal.

To be communicated to the Society on or before the firſt Tueſday in January, 1787.

N. B. As it is well known there are methods of preventing the ebullition of liquids, by the addition of particular matters in the boiling, it is ſubmitted to the conſideration of the ingenious, whether by the addition of ſome matters, or by ſome mechanical operations, the boiling and evaporation may not be increaſed.

111. The ſame premium is extended one year further. To be communicated to the Society on or before the firſt Tueſday in January, 1788.

113. ME-

112. METHOD OF COMPARING SWEETS. To the perſon who ſhall diſcover to the Society an Index or practical method of comparing, meaſuring, and aſcertaining the degrees of Sweetneſs in ſaccharine ſubſtances; the gold medal.

To be produced on or before the firſt Tueſday in January, 1787.

113. PREVENTING THE DRY ROT IN TIMBER. To the perſon who ſhall diſcover to the Society, the cauſe of the Dry Rot in Timber, and diſcloſe a certain method of prevention, ſuperior to any hitherto known; the gold medal.

The accounts of the cauſe and method of prevention, confirmed by repeated experiments, to be produced to the Society on or before the ſecond Tueſday in December, 1786.

114. The ſame premium is extended one year further.

The

The Accounts to be produced on or before the ſecond Tueſday in December, 1787.

115. BRONZE FOR COPPER MEDALS. To the perſon who ſhall diſcover to the Society a method of bronzing Copper Medals, equal to that practiſed in France; the gold medal.

To be produced to the Society on or before the ſecond Tueſday in December, 1786.

*Pre-*

*Premiums for promoting the Polite Arts.*

116. HONORARY PREMIUMS FOR DRAWINGS. For the beſt drawing of any kind, made with crayons, chalk, black lead, pen, Indian ink, or biſter, by young gentlemen under the age of twenty-one, ſons or grandſons of Peers or Peereſſes, in their own right, of Great Britain or Ireland; to be produced on or before the firſt Tueſday in March, 1787; the honorary medal of the Society in gold,

117. The ſame in ſilver for the ſecond in merit.

118, 119. The ſame premiums will be given, on the like conditions, to young ladies, daughters or grand-daughters of Peers or Peereſſes, in their own right, of Great-Britain or Ireland.

120. HONORARY PREMIUMS FOR DRAWINGS. For the beſt drawings of any

any kind, made with crayons, chalk, black lead, pen, Indian ink, or biſter, by young gentlemen under the age of twenty-one; to be produced on or before the firſt Tueſ- in March, 1787; the gold medal.

121. For the next in merit, the ſilver medal.

122, 123. The ſame premiums will be given for drawings by young ladies.

N. B. Perſons profeſſing any branch of the Polite Arts, or any buſineſs dependant on the arts of deſign, or the ſons or daughters of ſuch perſons, will not be admittted candidates in theſe claſſes.

*The following premium is offered in conformity to the Will of the late John Stock, of Hampſtead, Eſq.*

124. SCULPTURE. For the beſt model of the buſt of his Royal Highneſs the

the Prince of Wales, as large as the life; to be produced on or before the third Tueſday in November, 1786; the ſilver medallion, with the following engraved inſcription: *The premium given by the Society for the Encouragement of Arts, Manufactures and Commerce, in conformity to the Will of John Stock, of Hampſtead, Eſq.*

A caſt from the model to which the premium is adjudged is to remain the property of the Society.

125. DRAWINGS OF OUTLINES. For the beſt Outline after an original group or caſt in plaſter of human figures, by perſons of either ſex under the age of ſixteen, the principal figure not leſs than twelve inches; to be produced on or before the laſt Tueſday in November, 1786; the greater ſilver pallet.

126. For the next in merit, the leſſer ſilver pallet.

N. B.

N. B. Theſe drawings are to be made on paper with chalk, black lead, Indian ink, or biſter; and the originals either to be produced to the Society, or to be referred to for their examination.

127. DRAWINGS AFTER PICTURES. For the beſt drawing after a Picture of a Group of human figures, the principal figure not leſs than ſixteen inches, by perſons of either ſex under the age of ſixteen; to be produced on or before the laſt Tueſday in November, 1786; the greater ſilver pallet.

128. For the next in merit, the leſſer ſilver pallet.

The drawings to be made with Indian ink, chalk, or black lead, and of a different ſize from the original, which muſt be produced at the ſame time.

129. DRAWINGS OF MACHINES. For the beſt perſpective drawing, by per-

ſons of either ſex, under the age of twenty-one years, of the model of a Crane, by Mr. Bunce, in the Society's Repoſitory, ſhewing particularly the method of ſtopping the wheel by the centrifugal force of the ball, the greater ſilver pallet; to be produced on or before the third Tueſday in November, 1786.

N. B. Such candidates as propoſe to make drawings for this premium, will be admitted by the Regiſter any day (Sundays or Wedneſdays excepted) between the hours of ten and two.

The drawing to which the premium is adjudged, is to remain the property of the Society.

130. DRAWINGS OF BEASTS. For the beſt drawing and compoſition of three or more beaſts after nature, the principal figure to be not leſs than eighteen inches, by perſons of either ſex, under the age of eighteen years; to be made with

with chalk, black lead, pen, Indian ink, biſter, crayons, or water colours; to be produced on or before the third Tueſday in November, 1786; the greater ſilver pallet.

131. For the next in merit, the leſſer ſilver pallet.

132. DRAWINGS OF BIRDS. For the beſt drawing and compoſition, after nature, of not leſs than three different Birds, to be made with crayons or water-colours, by perſons of either ſex, under the age of eighteen years; to be produced on or before the third Tueſday in November, 1786; the greater ſilver pallet.

133. For the next in merit, the leſſer ſilver pallet.

134. DRAWINGS OF FRUIT, FLOWERS, OR PLANTS. For the beſt drawing, after nature, of Fruit, Flowers, or Plants, to be made with crayons, or

water-colours, by perſons of either ſex, under the age of ſixteen; to be produced on or before the third Tueſday in November, 1786; the greater ſilver pallet.

135. For the next in merit, the leſſer ſilver pallet.

136. DRAWINGS OF LANDSCAPES. For the beſt drawings of Landſcapes after nature, by perſons of either ſex, under twenty-one years of age; to be produced on or before the third Tueſday in November, 1786; the greater ſilver pallet.

137. For the next in merit, the leſſer ſilver pallet.

Each candidate muſt mention, on the front of his drawing, from whence he took his view; and the drawings muſt be made with chalk, pen, Indian ink, or biſter.

138. HIS-

138. HISTORICAL DRAWINGS. For the beſt Hiſtorical Drawing, being an original compoſition of five or more human figures; the height of the principal figure not leſs than eight inches; to be made with crayons, chalk, black lead, pen, Indian ink, or biſter; and to be produced on or before the third Tueſday in November, 1786; the gold pallet.

139. For the next in merit, the greater ſilver pallet.

*To the Maſters of Academies or Schools.*

140. TEACHING LANGUAGES. Whereas it has been obſerved that the living languages, or languages ſpoken in Schools, are much ſooner acquired than the dead languages, which are *only* taught grammatically;

The Society, deſirous to improve the preſent mode of education, hereby offers the gold medal to the maſter of any Academy, or School for boys, ſituated within, or not more than thirty miles diſtant from London, who ſhall within three years, from the date of this advertiſement, teach the greateſt number of ſcholars, not leſs than four, to write and to ſpeak Latin, in common converſation, correctly and fluently.

141, 142, 143. Alſo the gold medal, for teaching, in the like manner, each of the

the following languages, viz. the German, the Spaniſh, and the Italian, being commercial languages, not uſually taught at ſchools in England.

The maſters who propoſe to be candidates for the above premiums, are to ſend notice of their intention to claim them, to the Society, at their houſe in the Adelphi, on or before the ſecond Tueſday in November, 1786. Soon after which, the Society will appoint a day for examining the young gentlemen, and for adjudging the ſaid claims.

144, 145, 146. And in order to encourage aſſiduity in the ſcholars, whoſe maſters apply for the above premiums, the Society will give to the greateſt proficient in each of the ſaid languages; the ſilver medal.

N. B. Any information for the further improvement of the education of youth, in languages, will be thankfully received.

## CONDITIONS.

No perſon who has gained the firſt premium in any claſs, will be admitted a candidate in a claſs of an inferior age; and no candidate ſhall receive more than one premium in one year; nor will they who, for two ſucceſſive years, ſhall gain the firſt premium in one claſs, be ever again admitted as candidates in that claſs.

No perſon ſhall ever be admitted a candidate in any claſs, in which he has three times obtained the whole of the firſt premium.

No candidate ſhall ſend in more than one performance in any one claſs.

All the claims which are produced each year, before the Committee of Polite Arts, (to which premiums or bounties are adjudged, are to remain with the Society ſix weeks after the determination, unleſs the

the candidates, for particular reaſons, do apply to have the performance returned.

No claim for a premium in the Polite Arts will be admitted, that has obtained, or has been produced in order to obtain a premium, reward or gratification from any other Society, or any academy or ſchool.

All performances that obtain premiums in the Polite Arts, muſt be begun after the publication of ſuch premiums.

Purpoſely to encourage real merit, and to prevent any attempts to impoſe on the Society, by producing drawings which ſhall have been made or retouched by any other perſon than the candidate, the Society is reſolved upon all occaſions, with reſpect to the ſucceſsful candidates in claſſes 125 to 138 incluſive, to prove their abilities, by requiring a ſpecimen made under the inſpection of the Committee of Polite Arts, in every inſtance where ſuch proof can be obtained.

*Premiums*

*Premiums for encouraging and improving Manufactures.*

147. SILK. For the greateſt quantity of merchantable Silk, not leſs than five pounds, produced by any one perſon in England, in the year 1786; the gold medal.

Specimens of the Silk, not leſs than one pound, with Certificates that the whole is of equal quality, and produced in England, to be delivered to the Society on or before the firſt Tueſday in January, 1787.

148. For the ſecond greateſt quantity, not leſs than two pounds, the ſilver medal.

149, MACHINE FOR CARDING SILK. For the beſt machine, ſuperior to any now in uſe, for carding waſte Silk equally well as by hand; to be produced, together

together with a ſpecimen of the Cardings, on or before the firſt Tueſday in November, 1786; the gold medal, or twenty pounds.

150. WEAVING FISHING NETS. For the beſt ſpecimen of plain Netting, for Fiſhing Nets, not leſs than twenty yards long, and ſix feet deep, woven in a loom, or other machine; to be produced to the Society on or before the ſecond Tueſday in January, 1787; twenty guineas.

N. B. It is expected that the ſpecimen produced, be made in ſuch a manner, as to be cut and joined without more loſs than uſual; that it have ſuch a plain ſelvage as the common fiſhing nets; and that the knot be equally faſt with thoſe in nets in common uſe, and as eaſily repaired.

151. PAPER

151. PAPER FOR COPPER-PLATES. To the perſon who ſhall eſtabliſh in England or Wales, a manufacture of paper, equal to the paper imported from France, proper for receiving impreſſions from Mezzotinto, and other engraved copper-plates, and produce to the Society one ream, of the dimenſions of the French *ſuper-royal*, and one ream of the dimenſions of *colombier*, on or before the firſt Tueſday in November, 1786; the gold medal.

CERTIFICATES muſt be produced to the ſatisfaction of the Society, that the paper was made in England or Wales.

152. A ſtrong CLOTH being prepared in SWEDEN, from HOP STALKS, or BINDS, the Society will give the gold medal, or twenty pounds, as a premium for the beſt and greateſt quantity of ſuch Cloth, not leſs than twenty-five yards, made in England, and produced to the Society

Society, on or before the ſecond Tueſday in December, 1787.

One pound at leaſt of the Thread to be produced with the claim.

153. The ſame premium is extended one year further. The Cloth and Thread to be produced to the Society on or before the ſecond Tueſday in December, 1788.

154. PAPER FROM VEGETABLE SUBSTANCES NOT PREVIOUSLY MADE INTO CLOTH. To the perſon in England or Wales, who ſhall make the greateſt quantity, not leſs than ten reams, of the beſt and moſt uſeful paper, from vegetable ſubſtances that have not been previouſly made into cloth; ten guineas.

CERTIFICATES of the making ſuch paper, and one ream of the paper, to be produced on or before the firſt Tueſday in November, 1787.

N. B.

N. B. The Society are in poſſeſſion of two volumes, containing a great variety of ſpecimens of paper made from raw vegetables, viz, Thiſtles, Potatoe-Haum, Poplar, Hop Binds, &c. which volumes may be inſpected by any perſon, on application to the regiſter.

*Premiums*

*Premiums for Inventions in Mechanicks.*

155. TRANSIT INSTRUMENT. To the perſon who ſhall invent and produce to the Society, a cheap and portable Tranſit inſtrument, which may eaſily be converted into a Zenith Sector, capable of being accurately and expeditiouſly adjuſted for the purpoſes of finding the latitudes and longitudes of places, and ſuperior to any portable Tranſit inſtrument now in uſe; the gold medal, or twenty guineas.

To be produced on or before the laſt Tueſday in January, 1787.

156. GUN HARPOON. For every Whale taken by means of the Gun Harpoon, to the perſon who firſt ſtrikes ſuch fiſh therewith, two guineas.

N. B. Proper Certificates of the taking ſuch Whales, in the year 1786, ſigned by the maſter, or by the mate when the claim

claim is made by the maſter, to be delivered to the Society on or before the laſt Tueſday in December, 1786.

157. GUN FOR THROWING HARPOONS. To the perſon who ſhall produce to the Society, the beſt improvement in the conſtruction of a Gun for throwing Harpoons, ſo as to render it more manageable than thoſe at preſent in uſe; the ſilver medal, or ten guineas.

The Gun to be produced to the Society on or before the firſt Tueſday in December, 1786.

158. HARPOON TO BE THROWN BY A GUN. To the perſon who ſhall produce to the Society, the beſt improvement in the conſtruction of a Harpoon to be thrown by a Gun; the Harpoon to be ſo contrived, that it may ſtrike and hold the fiſh with more certainty and greater effect than any hitherto made uſe of; the ſilver medal, or ten guineas.

The

The Harpoon to be produced to the Society on or before the firſt Tueſday in December, 1786.

159. CROSS-BOW FOR THROWING HARPOONS. To the perſon who ſhall produce to the Society, the beſt conſtructed Croſs-Bow for throwing Harpoons, with more advantage and greater effect than any now known, or employed in the whale fiſhery; the ſilver medal, or ten guineas.

To be delivered to the Society on or before the firſt Tueſday in December, 1786.

160. CROSS-BOW HARPOON. For every whale taken by means of a Harpoon, ſhot from a Croſs-Bow; to the perſon who firſt ſtrikes ſuch fiſh therewith, two guineas.

Proper certificates of the taking ſuch whales in the year 1786, ſigned by the maſter, or by the mate when the claim

is made by the maſter, to be delivered to the Society on or before the laſt Tueſday in December, 1786.

161. The ſame premium is extended one year further; certificates to be delivered on or before the laſt Tueſday in December, 1787.

162. MACHINE FOR TRANSPORTING TIMBER. To the perſon who ſhall produce to the Society a model of the beſt, moſt ſimple, and cheap Machine or carriage for tranſporting Timber, or other heavy materials, on ſoft or clayey roads, at the leaſt expence; to be ſent in or before the laſt Tueſday in November, 1786; twenty guineas.

163. IMPROVEMENT OF THE HAND VENTILATOR. To the perſon who ſhall produce to the Society, on or before the laſt Tueſday in February, 1787, a portable Ventilator, to be worked by hand, better adapted and more efficacious

cious for extracting foul air from goals, priſons, and ſhips, than any now known or in uſe; the gold medal, or twenty guineas.

164. CRANES FOR WHARFS. To the perſon who ſhall invent and produce to the Society, a model of a Crane for Wharfs, on a ſcale of not leſs than one inch to a foot; the conſtruction to be ſuch, that the effect of the power may be varied according to the weight to be raiſed, in a manner different from any now known or in uſe, yet more ſimple and effectual; the gold medal, or twenty guineas.

To be produced on or before the firſt Tueſday in February, 1787.

N. B. The model ſhould neither be of the walking-wheel nor capſtan kind.

Although it is well known that the effect of the wind on horizontal Sails is greatly inferior to that on thoſe which

move in a vertical direction, yet, as there are ſome circumſtances and ſituations where it would be moſt convenient to erect an horizontal Mill, the Society do therefore offer the following premium.

165. HORIZONTAL WINDMILL. To the perſon who ſhall invent and produce to the Society, a model of an horizontal Windmill on a ſcale of not leſs than one inch to a foot, ſuperior to thoſe already in uſe; the gold medal, or twenty guineas.

To be delivered to the Society, on or before the firſt Tueſday in February, 1787.

166. HAND-MILL. To the perſon who ſhall produce to the Society a better conſtructed Hand Mill, for general purpoſes, than any now known or in uſe, the ſilver medal, or ten guineas; to be delivered to the Society on or before the laſt Tueſday in December, 1786.

166. MA-

167. MACHINE FOR RAISING COALS, ORE, &c. &c. To the perſon who ſhall invent a machine for raiſing Coals, Ore, &c. from mines which ſhall produce the effect at a leſs expence than thoſe already known or in uſe; the gold medal, or twenty guineas.

A model of the Machine, made on a ſcale of not leſs than one inch to a foot, to be produced to the Society, on or before the ſecond Tueſday in February, 1787.

168. SLUICES FOR SCOURING CHANNELS. To the perſon who ſhall invent and produce to the Society, a model of a Sluice or Water Gate, conſtructed in ſuch manner as to be with eaſe and expedition ſo diſpoſed as to ſcour a Channel increaſing in width equal at leaſt to an angle of forty-five degrees; twenty guineas.

To be produced on or before the ſecond Tueſday in February, 1787.

169. CLEANSING RESERVOIRS. To the perſon who ſhall, by a drawing with proper explanations thereof, or by a model, produce to the Society a method ſuperior to any now in uſe for cleanſing Reſervoirs, Baſons, &c. by means of the water contained therein; twenty guineas.

To be produced on or before the ſecond Tueſday in February, 1787.

170. MACHINE FOR CLEARING RIVERS. For the beſt model of a machine, ſuperior to any now in uſe, for clearing Navigable Rivers from Weeds, at the leaſt expence; ten guineas.

To be produced to the Society on or before the firſt Tueſday in February, 1787.

171. SECURING BUILDINGS FROM FIRE. To the perſon who ſhall produce to the Society, an effectual method of preventing accidental Fires in houſes or other buildings; twenty guineas.

To be produced on or before the ſecond Tueſday in February, 1787.

*Premiums*

*Premiums offered for the Advantage of the Britiſh Colonies.*

172. NUTMEGS. For the greateſt quantity of merchantable Nutmegs, not leſs than five pounds weight, being the growth of his Majeſty's dominions in the Weſt Indies, and equal to thoſe imported from the iſlands of the Eaſt Indies; the gold medal, or one hundred pounds.

Satisfactory certificates from the governor, lieutenant-governor, preſident of the council, or ſpeaker of the houſe of aſſembly, of the place of growth, with an account of the number of trees, their age, nearly the quantity of fruit on each tree, and the manner of culture, to be produced on or before the firſt Tueſday in January, 1787.

173. The ſame premium is extended one year further.

CERTIFICATES to be produced on or before the ſecond Tueſday in December, 1788.

N. B. Any perſon deſirous of information on the ſubject of Nutmeg Trees, may obtain it from a memorial on the fructification of the Nutmeg, and the ſureſt method of cultivating it to advantage, by the King's Gardener, at the Iſle of Bourbon, inſerted in Mr. Maty's Review, for Auguſt, 1783.

174, 175. BREAD-FRUIT TREE. To the perſon or perſons, who between the firſt of June, and the fifteenth of Auguſt, 1787, ſhall bring into the port of London the greateſt number of plants of one or both ſpecies of the Bread-Fruit Tree, in a growing ſtate, not leſs than three of either ſpecies; the gold medal.

176, 177. The ſame premiums are extended one year further; the plants to be

be brought into the port of London, between the firſt of June, and the fifteenth of Auguſt, 1788.

N. B. The plants which obtain the premiums are to be the property of the Society, to be diſpoſed of according to their diſcretion.

THE SOCIETY, being informed that a conſiderable quantity of oil can be obtained from the ſeed of Cotton, and that, after the expreſſion of the oil, the remaining cake will afford a ſtrong and hearty food for cattle; and likewiſe, that the apparatus for the operation can be applied to the mill for ſugar-canes, and worked in the rainy ſeaſon, at a moderate expence; have reſolved, for the foregoing reaſon, that the procuring oil from the ſeed of Cotton, is a proper object of a premium, conſidered as an encouragement for planters to extend the cultivation of Cotton, an article

article eſſentially requiſite to increaſe the manufacture of that commodity in this country.

The Society therefore offer as follows:

178. OIL FROM COTTON SEED. To the planter, in any of the Britiſh Iſlands of Weſt Indies, who ſhall expreſs oil from the ſeed of Cotton, and make, from the remaining ſeed, hard and dry cakes, as food for cattle; the gold medal.

CERTIFICATES that not leſs than one ton of the oil has been expreſſed, and five hundred weight of the cakes obtained, to be produced to the Society, with two gallons of the oil, and two dozen of the cakes, together with a full account of the proceſs, on or before the laſt Tueſday in November, 1786.

179. For

179. For the next greateſt quantity, not leſs than half a ton of oil, and two hundred weight of the cakes; the ſilver medal.

180, 181. The ſame premiums are extended one year further.

CERTIFICATES and ſamples to be produced on or before the laſt Tueſday in November, 1787.

182, 183. The ſame premiums are extended one year further.

CERTIFICATES and ſamples to be produced on or before the laſt Tueſday in November, 1788.

184. SPIRIT FROM THE PULP OF THE COFFEE-BERRY. To the Planter, in any of the Britiſh Iſlands in the Weſt Indies, who ſhall diſtill the greateſt quantity of Spirit, from the Pulp of the Coffee Berry, not leſs than thirty gallons, and

and produce to the Society one gallon of the ſpirit, together with an account of the proceſs uſed in the making it; the gold medal.

185. For the next greateſt quantity, not leſs than fifteen gallons, the ſilver medal.

CERTIFICATES, ſigned by the governor, lieutenant-governor, or ſome perſons of known credit in the iſland, to be delivered to the Society, on or before the firſt Tueſday in January, 1787.

186. The ſame premiums are extended one year further.

CERTIFICATES and ſamples to be produced on or before the firſt Tueſday in January, 1788.

187. SENNA. To the perſon who ſhall import into the port of London, in the year 1786, the greateſt quantity of Senna, not leſs

leſs than two hundred weight, the growth of any of the Britiſh Iſlands in the Weſt-Indies, and equal to the *Alexandrian Senna*, now uſed for medicinal purpoſes; the gold medal.

CERTIFICATES of the growth and method of culture, to be produced to the Society on or before the firſt Tueſday in February, 1787.

188. The ſame premium is extended one year further.

CERTIFICATES to be produced on or before the firſt Tueſday in February, 1788.

189. The ſame premium is extended one year further.

CERTIFICATES to be produced on or before the firſt Tueſday in February, 1789.

Society's

Society's Office, Adelphi, May 24, 1786.

Ordered,

THAT THE SEVERAL CANDIDATES AND CLAIMANTS TO WHOM THE SOCIETY SHALL ADJUDGE PREMIUMS OR BOUNTIES, DO ATTEND AT THE SOCIETY'S OFFICE IN THE ADELPHI, ON THE LAST TUESDAY IN MAY, 1787, AT TWELVE O'CLOCK AT NOON, TO RECEIVE THE SAME; THAT DAY BEING APPOINTED BY THE SOCIETY FOR THE DISTRIBUTION OF THEIR REWARDS: AND BEFORE THAT TIME NO PREMIUM OR BOUNTY WILL BE DELIVERED.

IN CASES WHERE PERSONAL ATTENDANCE CANNOT BE GIVEN, DEPUTIES MAY BE SUBSTITUTED TO RECEIVE THE REWARDS.

GENERAL

## GENERAL CONDITIONS.

Notwithſtanding the Society reſerve to themſelves the power of giving, in all caſes, ſuch part only of any premium as the performance ſhall be adjudged to deſerve, or of with-holding the whole, if there be no merit; yet the Candidates may be aſſured, the Society will always judge liberally of their ſeveral claims.

It is required, that the matters for which premiums are offered, be delivered in without names, or any intimation to whom they belong; that each particular thing be marked in what manner each claimant thinks fit, ſuch claimant ſending with it a paper ſealed up, having on the outſide a correſponding mark, and on the inſide the claimant's name and addreſs.

No

No papers ſhall be opened, but ſuch as ſhall gain premiums, unleſs where it appears to the Society abſolutely neceſſary for the determination of the claim; all the reſt ſhall be returned unopened, with the matters to which they belong, if inquired after by their marks within two years; after which time, if not demanded, they they ſhall be publicly burnt, unopened, at ſome meeting of the Society.

All models of machines, which obtain premiums or bounties, ſhall be the property of the Society.

All the premiums of this Society are deſigned for that part of Great Britain called England, the dominion of Wales, and the town of Berwick upon Tweed, unleſs expreſsly mentioned to the contrary.

The claims ſhall be determined as ſoon as poſſible after the delivery of the ſpecimens.

No

No perſons ſhall receive any premium, bounty or encouragement, from the Society, for any matter for which he has obtained, or propoſes to obtain, a patent.

A candidate for a premium, or a perſon applying for a bounty, being detected in any diſingenuous method to impoſe on the Society, ſhall forfeit ſuch premium or bounty, and be deemed incapable of obtaining any for the future.

The performances which each year obtain premiums or bounties, are to remain with the Society until the end of May, except as mentioned in the conditions annexed to the premiums offered for promoting the Polite Arts.

No member of this Society ſhall be a candidate for, or entitled to receive any premium, bounty, or reward whatſoever, except the honorary medal of this Society.

Where Certificates are required to be produced in claim of premiums, they ſhould be expreſſed as nearly as poſſible in the words of the reſpective advertiſements, and ſhould not be from the candidate (ſolely), but from ſome other perſon, or perſons, who have a poſitive knowledge of the facts certified.

Where premiums, or bounties, are obtained, in conſequence of ſpecimens produced, the Society mean to retain ſuch part as they may judge neceſſary, making a reaſonable allowance for the ſame.

No candidates ſhall be preſent at any meetings of the Society or Committees, or admitted at the Society's rooms, after they have delivered in their claims, till ſuch claims are adjudged, unleſs ſummoned by the Committee.

N. B. Any information or advice that may forward the deſigns of this Society for the

the public good, will be received thankfully, and duly conſidered, if communicated by letter, addreſſed to the Society, and directed to Mr. More, the Secretary, at the Society's office, in the Adelphi Buildings, London.

*** In caſe any perſon ſhould be inclinable to leave a ſum of money to this Society, by will, the following form is offered for that purpoſe:

*Item.* I give and bequeath unto A. B. and C. D. the ſum of upon condition and to the intent that they, or one of them, do pay the ſame to the Collector for the time being, of a Society in

London, who now call themſelves the Society for the Encouragement of Arts, Manufactures, and Commerce; which ſaid ſum of I will and deſire may be paid out of my perſonal eſtate, and applied towards the carrying on the laudable deſigns of the Society.

By order of the Society,

SAMUEL MORE, Secretary.

A LIST

A

# LIST

OF

## CONTRIBUTING MEMBERS.

N. B. Thoſe marked with ** pay Five Guineas annually; thoſe marked with * Three Guineas annually; and thoſe with P are Perpetual Members.

A.

** ABERCORN James, Earl of
Ailſbury Thomas, Earl of
Affleck Admiral Sir Edmund, Bart. M. P.
Andrews Sir Joſeph, Bart. *Shaw, Berks*
Abbot Lemuel Francis, Eſq. *Ruſſel-ſtreet, Bloomſbury*
Adair Alexander, Eſq. *Pall-Mall*
Adam James, Eſq. *Albemarle-ſtreet*
Adam Robert, Eſq. F. R. S. *Ditto*
Adam William, Eſq. *Ditto*

Adams Mr. William, *Grafton-ſtreet*

Addington William, Eſq. *Clarges-ſtreet, Piccadilly*

Affleck Captain Philip, *Wimpole-ſtreet, Cavendiſh-ſquare*

Affleck Captain William, *Ditto*

Agace Mr. Daniel, *Goldſmith-ſtreet, Cheapſide*

Aguilar Honourable Ephraim Baron, *Broad-ſtreet Buildings*

Allen John, Eſq. No. 14, *Clement's-Inn*

Alexander William, Eſq. *Temple*

Allen William, Eſq. *Southampton-row*

Almack William, Eſq. *Boſwell-court, Chancery-lane*

Angerſtein John Julius, Eſq. *Old Broad-ſtreet*

P Anneſly Honourable Richard, Eſq. *Dublin*

Antrobus Edmund Eſq. *Adam-ſtreet, Adelphi*

Arden Richard Peppar, Eſq. M. P. Attorney General, *Lincoln's-Inn-fields*

Arkwright Mr. Richard, *Crumford, Derbyſhire*

Armſtrong Mr. Moſtyn John, *Norwich*

Arrow Mr. James, *Rocheſter-row, Weſtminſter*

P Aſhby Shukbrugh, Eſq. F.R.S. *Great Ormond-ſtreet*

Aſhmore Mr. Thomas, *Ely-place, Holborn*

Aſſer Mr. James, No. 15, *Curſitor-ſtreet*

P Aubert Alexander, Eſq. F.R.S. *Auſtin-friars*

Auriol Mr. James, No. 17, *Chancery-lane*

Bute,

B

P Bute John, Earl of

P Buchan David, Earl of, LL. D. F.R. and A.S.

Briſtol Right Rev. Frederick, Earl of, F.R.S.

Bulkeley Thomas, Lord Viſcount, *Berkley-ſquare*

P Barrington, The Honourable Daines, F.R.S. and A. S. *Temple*

Bruhl, His Excellency Count De, *Dover-ſtreet*

Berchtold, The Honourable Count, *Prague, in Bohemia*

Blacket Sir Edward, Bart. *Clarges-ſtreet*

Bridgeman Sir Henry, Bart. M. P. *St. James's ſquare*

Bridger Sir John, *Combe, Suſſex*

Bacon John, Eſq. R. A. No. 17, *Newman-ſtreet*

Bacon John, Eſq. *Temple*

Baker John, Eſq. *Princes-ſtreet, Spital-fields*

Baldwin Richard, Eſq. *Weſt-Smithfield*

P Barclay David, Eſq. *Red-lion-ſquare*

Baring Francis, Eſq. M.P. *Mincing-lane*

Baring John, Eſq. M.P. *Ditto*

P Barnard Mr. William, *Deptford*

Barnard Mr. Thomas, *Adelphi*

Barret Mr. Bryant, *Strand*

Barron Mr. Thomas, *Saliſbury-ſtreet, Strand*

Bartolozzi Francis, Eſq. R.A. *North-end*

Batſon Mr. Robert, *Limehouſe*

Bayley Mr. John, No. 2, *High-ſtreet, Mary-le-bone*

Baynard John, Eſq. *Strand*

Baynes Mr. John, *Black-friars-bridge*

Bean Mr. Alexander, *Drury-lane*

Beard Mr. John, No. 12, *Doctors commons*

* Beaufoy Henry, Eſq. M. P. F. R. S. *Great George-ſtreet, Weſtminſter*

Betteſworth Thomas, Eſq. *Mark-lane*

Biddulph John, Eſq. *Burton-hall, Suſſex*

Birt Richard, Eſq *Carey-ſtreet*

Blackburne John, Eſq. M. P. *Park-ſtreet, Weſtminſter*

Blackiſton Mr. George, *Strand*

Blake Mr. William, *Alderſgate-ſtreet*

Bland John, Eſq. *Lombard-ſtreet*

Blizard Mr. William, F.A.S. *Lime-ſtreet*

Blofeld Thomas, Eſq. *Garden-court, Temple*

P Boehm Edmund, Eſq. *Siſe-lane*

* Bootle Richard Wilbraham, Eſq. M. P. F. R. S. *Bloomſbury-ſquare*

Boratt Thomas, Eſq. *Shoreham, near Seven-oaks, Kent*

Boulton Matthew, Eſq. F.R.S. *Sohe, near Birmingham*

P Bowdoin James, Eſq.

Boydell John, Eſq. and Alderman, *Cheapſide*

Bramſton Thomas Berney, Eſq. M. P. *Albemarle-ſtreet*

Bramah Mr. Joſeph, *Piccadilly*

Braithwaite Daniel, Eſq. F.R. and A.S. *Poſt-office*

P Brander Guſtavus, Eſq. F.R. and A.S.

Bridgen Edward, Eſq. F.R. and A.S. *Paternoſter-row*

Bridges Mr. Kemp, jun. *Charlotte-ſtreet, Rathbone-place*

* Brereton Owen Saluſbury, Eſq. V.P.F.R. and A.S. *Soho-ſquare*

Brehm Major Diederick, *South-Molton-ſtreet*

P Broadhead Theodore Henry, Eſq. *Portland-place*

Brookſhaw Mr. John, No. 48, *Great Marlborough-ſtreet*

Brown Mr. John, *Holborn*

Brown Mr. Joſeph, *George-yard, Lombard-ſtreet*

Browne Iſaac Hawkins, Eſq. M.P. F.R.S.

Browne Mr. Robert, *King's-mews*

Browne Thomas, Eſq.

Brudenell George Bridges, Eſq. M.P. *Great George-ſtreet, Weſtminſter*

Brummell William, Eſq. *Charles-ſtreet, Berkeley-ſquare*

Bryer William, Eſq. *South-Molton-ſtreet*

Bucknall Thomas Skip, Eſq. *Conduit-ſtreet*

Buggin James, Eſq. *Hatton-ſtreet*

Bulcock Mr. William, *Adelphi*

Bullock Thomas, Eſq. *Pall-Mall*

Bunn Robert, Eſq. *Gould-ſquare, Crutched-friars*

Burney Mr. John, *Bank-ſide*

Burrow Mr. Reuben, *Eaſt-Indies*

Butts Mr. John, *Fleet-ſtreet*

Byfield Mr. George, *Mancheſter-buildings*

## C

P Cardiff John, Lord

P Carmarthen Francis, Marquis of, F.R. and A.S,

**Chaulnes Monſieur, Le-Duc De, *Paris*

**Cavendiſh, Lord George

Compton, Lord, M.P.

**Courtenay William, Lord Viſcount

Cremorne Thomas, Lord Viſcount

P Conway, Right Honourable Lieutenant-General Henry Seymour, M.P.

Cavendiſh Honourable Henry, F. R. and A. S. *Gower-ſtreet, Bedford-ſquare*

Calverley Thomas, Eſq. *Ewell, Surry*

Cameron

Cameron Donald, Eſq. *Walbrook*

Campbell, Major General Archibald

Chambers Chriſtopher, Eſq. *Mincing-lane*

Caulfield Wade, Eſq. F.R.S. *Mortimer-ſtreet*

Chandler Henry John, Eſq. *Bentinck-ſtreet*

Changeux Monſieur Pierre Jaques, *Paris*

Charrington John, Eſq. *Mile-end*

Chavany Mr. Peter, *Caſtle-ſtreet, Leiceſter-fields*

Clarke Richard, Eſq. Alderman, *Bridge-ſtreet, Blackfriars*

Clarke Mr. Henry, *Broad-ſtreet*

P Clark Mr. James

Clements Captain John, *Wimpole-ſtreet*

Colborne Thomas, Eſq. *Sackville-ſtreet*

Cole Mr. Martin, *Channel-row, Weſtminſter*

P Colepeper John Spencer, Eſq.

Collins Thomas, Eſq. *Berners-ſtreet*

Collinſon Mr. John

Collinſon Thomas, Eſq.

Compton Mr. Henry, *Charlotte-ſtreet, Pimlico*

Conant Nathaniel, Eſq. *Lamb's-conduit-ſtreet*

P Coningham James, Eſq. *Pancras-lane, Queen-ſtreet, Cheapſide*

Cook Benjamin, Muſ. D. *Dorſet-court, Weſtminſter*

Cooke

Cooke Rev. Mr. James, *Heaton-Norris, near Manchester*

Cooke, Major William, *Ormond-ſtreet*

Cooke William, Eſq. *Queen's-ſquare*

P Cooper Mr. John, *Portpool-ſtreet*

Cooper Mr. Benjamin, *Blackfriars-road, Surry*

Cope William, Eſq. *Sanctuary, Weſtminſter*

Coulſon Jukes, Eſq. *Thames-ſtreet*

Couſſmaker Lannoy Richard, Eſq. *Warnford-court*

Craddock Joſeph, Eſq. *Grumley, Leiceſterſhire*

Cranke Mr. William, *Biſhopſgate-ſtreet*

Crathorne Henry Ralph, Eſq. *Yorkſhire*

Crawſhay Richard, Eſq. *George-yard, Thames-ſtreet*

Crewze Francis, Eſq. *Lowlayton, Eſſex*

Crowder William Henry, Eſq. *Middle Temple*

## D.

**Dartmouth William, Earl of, F.R.S.

P Dolben Sir William, Bart. V.P. M.P. *Duke-ſtreet, Weſtminſter*

Dagge Henry, Eſq. F. R. S. *Great Ruſſel-ſtreet, Bloomſbury*

Darch Major Thomas, *Gower-ſtreet, Bedford-ſquare*

Davenport John, Eſq. *Taviſtock-ſtreet, Covent-garden*

Davis William, Eſq. *Great Tower-hill*

* Daviſon

* Daviſon James, Eſq. V. P. *Queen Ann-ſtreet*
Dawes John, Eſq. *Iſlington*
De Berdt Dennis, Eſq. *New Broad-ſtreet*
Dehany Philip, Eſq. *Queen Ann-ſt. Cavendiſh-ſquare*
Dent Robert, Eſq. *Temple-bar*
Deſanges, Mr. William, *Wheeler-ſtreet, Spitalfields*
Deſbarres Joſeph Frederick Wallet, Eſq.
Devaynes Mr. John, *Spring-gardens*
Deval Mr. John, *Portland-ſtreet*
Dickinſon Charles, Eſq.
Dodſley Mr. James, *Pall-mall*
Dolben John Engliſh, Eſq.
Dollond Mr. Peter, *St. Paul's Church-yard*
Dollond Mr. John, *ditto*
Douglas Captain Peter, *Robert-ſtreet, Adelphi*
Downman John, Eſq. *Leiceſter-fields*
Drake George, Eſq. *Bedford-ſquare*
Drake Mr. Samuel, *Margaret-ſtreet, Weſtminſter*
Draper Mr. John, *Maze-pond, Southwark*
Drew Mr. Thomas, *Charlotte-ſtreet, Portland-place*
P Dreyer Mr. Maurice
Duberly James, Eſq. *Piazza, Covent-garden*
Dubourg Mr. Richard, *Duke-ſtreet, Mancheſter-ſquare*
Dunn Samuel, Eſq. *Adelphi*

Dunn

Dunn Mr. Edward, *Mount-ſtreet, Groſvenor-ſquare*

P Dupré Joſias, Eſq. *Upper Brook-ſtreet*

P Duroure, Lieutenant-Colonel, F. R. and A. S. *Old Burlington-ſtreet*

Duval Mr. John Peter, *Hackney*

## E.

P Egremont, George Wyndham, Earl of

P Eliott, the Right Honourable Sir George Auguſtus, General, K. B. V. P.

Earle James, Eſq. *Hanover-ſquare*

Earle Henry, Eſq. *Temple*

Eaton, Rev. Stephen, *St. Anne's, Soho*

P Eaton Peter, Eſq. *Weſtford, Eſſex*

Eckerſall John, Eſq. *Burford-houſe, near Dorking, Surry*

Eddie Mr. Alexander, *Strand*

Edgworth Richard Lovell, Eſq. F.R.S.

P Ellicott Mr. Edward, *Royal Exchange*

P Errington John, Eſq. *Hill-ſtreet*

Errington George, Eſq.

Evans Mr. John, *Ely-place*

Evans Morgan, Eſq. *Lincoln's Inn*

* Ewer Samuel, Eſq. *Camberwell*

Ferrers

## F.

Ferrers Robert, Earl

P Fitzwilliam Richard, Lord Viſcount, F.R.S.

* Fludyer Sir Samuel, Bart. *Downing-ſtreet*

Finch, the Honourable Captain William, *Albury, near Guildford*

P Fletcher Sir Henry, Bart. M.P. *Southampton-row, Bloomſbury*

Fordyce Sir William, Kt. *George-ſtreet, Hanover-ſquare*

Farmer Samuel, Eſq. *Beckenham, Kent*

P Felton Samuel, Eſq. F. R. and A. S. *Charlotte-ſtreet, Portland-place*

P Fermor William, Eſq. *South-ſtreet*

Feuilletau William, Eſq. *Brompton*

Fitzgerald John, Eſq. *Clifford-ſtreet*

Fowler David Burton, Eſq. *Fig-tree-court, Temple*

Fordyce Alexander, Eſq.

Fordyce George, M. D. F. R. S. *Eſſex-ſtreet, Strand*

Frankland William, Eſq. *Cavendiſh-ſquare*

Frankland William, Eſq. *Gray's-inn*

Frankland Roger, Eſq. *Chriſt-Church College, Oxford*

Franks William, Eſq. F. R. S. *Percy-ſtreet, Rathbone-place*

P Frank-

P Franklin Benjamin, LL.D. F.R.S.

Freeman Thomas Edwards, Eſq. M. P. *Sackville-ſtreet*

Freeman Stephen, M. D. *Strand*

Frend Mr. George, *Great James-ſtreet, Bedford-row*

Fuller William, Eſq. *New-road, Southwark*

## G.

* Groſvenor Richard, Earl, F. R. S.

P Greville Right Honourable Charles, M.P. F.R.S.

Grey Sir Henry, Bart. *Howick, Northumberland*

Gibbes Sir Philip, Bart.

Gape Joſeph, Eſq. *Bridge-ſtreet, Weſtminſter*

P Gauſſen Mr. Peter, *Little St. Helen's*

Geary William, Eſq. *Oxen-heath, Kent*

Giſborne Thomas, M. D. F. R. S. *Clifford-ſtreet*

Glenny George, Eſq. *Bromley-hill, Kent*

P Godſchall William Man, Eſq. F. R.S.

Grant Major John

* Green Valentine, Eſq. F. A. S. *Newman-ſtreet*

Green Mr. William, *Croydon*

Green Mr. Hezekiah, *Drury-lane*

Greenwood Abraham, Eſq. *Steining-lane*

Gordon James, jun. Eſq. M. P. *Moor-place, Herts*

Gower Charles, Eſq. *Oriel College, Oxford*

Gray

Gray Alexander, Eſq. *Spring-gardens*
Gregory Mr. Henry, *Leadenhall-ſtreet*
Greſley Reverend William
Griffin Mr. George, *Queen-ſtreet, Cheapſide*
P Griffith Edward, Eſq. of *Carnarvon*
Grigby Joſhua, Eſq. M. P. *Drinkwater, near Bury, Suffolk*
Grignion Mr. Thomas, *Ruſſel-ſtreet, Covent-Garden*
Grote Andrew, Eſq. *Threadneedle-ſtreet*
Groves Mr. John, *Millbank*
Grub John, Eſq. *Lincoln's-inn-fields*
Gullet Chriſtopher, Eſq. *Exeter*

## H

** Hardwicke Philip, Earl of, F. R. and A. S.
P Hillſborough Wills, Earl of, F.R.S.
Hawke Martin, Lord
Howard John, Lord
P Hume Sir Abraham, Bart. F.R.S. *Wormleybury*
Harley Right Honourable Thomas, Alderman, M. P. *Alderſgate-ſtreet*
P Hagen Mr. Jacob, *Walworth*
Hale William, Eſq. *Groſvenor-place*
Hall Mr. Abraham, *Aldermanbury*

Hall Mr. Nathaniel, *Parliament ſtreet*

Hamilton, Rev. Anthony, D.D. F.R. and A.S. *St. Martin's in the Fields*

Hamond William Parker, Eſq. *Berners-ſtreet*

Hanmer Edward, Eſq. *Sampſon-place, Bucks*

Hanway Jonas, Eſq. *Red-lion-ſquare*

Harborne Richard, Eſq. *John-ſtreet, Adelphi*

Harris John, Eſq. *Newington-butts*

Hartley Mr. Thomas, *Fiſh-ſtreet-hill*

* Haſtings Warren, Eſq. *St. James's place*

Hawes Francis, Eſq. *Reading, Berks*

Hayter Mr. Jonathan, No. 6, *King-ſtreet, Cheapſide*

Hayward Mr. Richard, *Piccadilly*

Haywood Mr. James, *Walton on Thames*

Heaviſide Richard, Eſq. *Peterborough houſe, Fulham*

P Hebert James, Eſq. *Charlotte-ſtreet, Portland-place,*

Henderſon Chriſtopher, Eſq. *Roberts ſtreet, Adelphi*

Herne Mr. William, *Paternoſter-row*

* Hewett John, Eſq.

Hewlett Mr. William, *Strand*

Hilliard Edward, Eſq. *Lincoln's-inn*

Hincks Mr. William, *Mortimer-ſtreet, Cavendiſh-ſquare*

Hodſkinſon Mr. Joſeph, *Arundel-ſtreet*

**Hoare

**Hoare Henry, Eſq. *Fleet-ſtreet*

Hodges William, Eſq. *Queen-ſtreet, May-fair*

Hodgſon Samuel, Eſq. *Howland-ſtreet, Rathbone-place*

Hodgſon Mr. John, *Vauxhall*

Hodſoll Edward, Eſq. *Strand*

Holland Mr. Richard, *Half-moon-ſtreet, Piccadilly*

Hollis Thomas Brand, Eſq. F.R. and A.S.

Hollis Timothy, Eſq. *Great Ormond-ſtreet*

* Hooper Edward, Eſq. V.P. F.R.S. *Hertford-ſtreet*

Honeybourne Mr. Robert, *Stourbridge*

Hopkins Benjamin Bond, Eſq. M.P. *Wimbleton*

Horton Mr. William, No. 12, *Newgate-ſtreet*

* Houblon Jacob, jun. Eſq.

Houghton William Eſq.

Houlditch Mr. Edward, *Long-acre*

P Howard John, Eſq. F.R.S. *Cardington, Bedfordſhire*

P Hudſon Vanſittart, Eſq. *Temple*

Hull Chriſtopher, Eſq. *Hare-court, Middle-temple*

Hunter John, Eſq. M. P. *Bedford-ſquare*

Hurlock Joſeph, Eſq. F.R.S. *John-ſtreet, King's-road*

Huſſey John, Eſq. *Chelſea-hoſpital*

Hutchinſon Samuel, Eſq.

Hyde John, Eſq. *New Bond-ſtreet*



P Ilcheſter

## I

P Ilcheſter Henry Thomas, Earl of
P Jebb Sir Richard, Bart. F. R. and A. S.
Jones Sir William, Bart. *Cavendiſh-ſquare*
Jackſon Henry, M. D. *Hanover-ſtreet, Hanover-ſquare*
Jacob Mr. Joſeph, *Greek-ſtreet, Soho*
P Jamineau Iſaac, Eſq.
Jardin Mr. John, *Princes-ſtreet, Lothbury*
Jarman Nathaniel Eſq. *Diſtaff-lane*
Jeffery George, Eſq. *Throgmorton-ſtreet*
P Jenkins Thomas, Eſq. *Rome*
Jenner Mr. Robert, *Doctors-commons*
Jervoiſe, Jervoiſe Clarke, Eſq. M.P. *Hanover-ſquare*
* Johnes Thomas, Eſq. M. P.
Johnſon Alexander, L L. and M. D. *Portland-ſtreet*
Johnſon Mr. Edward, *St. pney-green*
Johnſon John, Eſq. *Berners-ſtreet*
Johnſtone Captain John, *Inner-Temple*
Jones Mr. Francis, *Groſvenor-ſtreet*
Jones Mr. Thomas, *Fiſh-ſtreet-hill*

## K

King Peter, Lord
Kaye Rev. Richard, Dean of Lincoln, LL. D.
F. R. and A. S.

P Keck

P Keck Anthony, Eſq. *Twickenham*

Kendrick Mr. Edward, *King-ſtreet, Covent-garden*

Kennett Mr. Benjamin, junior, *Eſſex-ſtreet, Strand*

Keyſall John, Eſq. *Queen-ſquare, Holborn*

King, The Rev. John Glen, D. D. F. R. and A. S. *Wormley, Hertfordſhire*

P Kinleſide William, Eſq. *Paddington*

Kirke Capt. James, *Victualling Office*

Kitchiner William, Eſq. *Beaufort-buildings*

## L

**Leiceſter George, Earl of, F. R. and A. S.

* Landaff Richard, Lord Biſhop of, F.R.S.

P Lewiſham George, Lord Viſcount, F.R. and A.S.

Long Sir James Tylney, Bart. M.P. *Groſvenor-place*

Lyde Sir Lyonel, Bart. F.R. and A.S. *Bedford-ſquare*

P Laurent Sir Francis, Kt.

* Lewes Sir Watkin, Kt. V. P. M.P. *King's-road*

Leatham Mr. William, *Chatham-ſquare, Blackfriars*

Lettſom John Coakley, M.D. F.R. and A.S. *Baſing-hall-ſtreet*

Levy Moſes Iſaac, Eſq. *Lincoln's-inn-fields*

Lewin Robert, Eſq. *Bank*

Lewis John, Eſq. *Queen-Ann-ſtreet Eaſt*

Lewis Percival, Eſq. *Lincoln's-Inn*

Lewis Iſrael, Eſq. *Hampſtead*

Life Mr. Macey, *Craven-ſtreet, Strand*

Lilly Mr. Thomas, *Pancras-lane*

Lindſell Vaughan, Eſq.

* Lock William, Eſq.

* Loveden Edward Loveden, Eſq. M.P. *Conduit-ſtr.*

Lowndes William, Eſq. *Scotland-yard, Whitehall*

Lucas Bartholomew, Eſq. *Ludgate-hill*

Lunardi Vincent, Eſq. *Poland-ſtreet*

## M

**Montague George, Duke of, F.R.S.

**Manners, Lord James

Milford Richard Lord, M.P.

**Marſham, Honourable Charles, V.P. M.P. F.R.S.

Murray, Honourable General James, M.P. F.R.S. *Beauport, Suſſex*

Mackworth Sir Herbert, Bart. V.P. M.P. F.R. and A.S. *Queen-Ann-ſtreet, Cavendiſh-ſquare*

Mawbey Sir Joſeph, Bart. M.P. *Great George-ſtreet, Weſtminſter*

Middleton

Middleton Sir Charles, Bart. M.P. *Hertford-ſtreet, May-fair*

Macham William, LL.D. *Doctors-Commons*

Mackey Robert, Eſq. *Queen-ſtreet, Cheapſide*

Mackreth Mr. Francis, *Pall-mall court*

Mackreth Robert, Eſq. M.P. *Cork-ſtreet*

Macnamara John, Eſq. M.P. *Stratton-ſtreet*

Magellan Mr. John Hyacinth, F.R.S. *Nevil's court, Fetter-lane*

Malcolm Mr. William, *Kennington*

Martin James, Eſq. M.P. *Lombard-ſtreet*

Martin Mr. John, *Southampton*

Martyn the Rev. Thomas, B. D. *Profeſſor of Botany, Cambridge*

Maſefield Mr. Richard, *Strand*

P Maſon Rev. William, *Curzon-ſtreet*

Maſſey Mr. William, *Fenchurch-ſtreet*

Mathew Job, Eſq. *Laytonſtone, Eſſex*

Matthews Edward, Eſq. *Tottenham-court-road*

Meadows Mr. John, *New Peter-ſtreet, Weſtminſter*

**Methuen Paul, Eſq. *Lower Groſvenor-ſtreet*

Meyrick John, Eſq. *Parliament-ſtreet*

Michie Jonathan, Eſq. *Craven-ſtreet, Strand*

Middleton Mr. John, *Vauxhall-walk, Lambeth*

Miers Mr. John, *Cannon-ſtreet*

Mildred Daniel, Eſq. *Lombard-ſtreet*
Millington Mr. Thomas, *George ſtr. Hanover-ſquare*
Mills Mr. Benjamin, *Middle Moorfields*
Miniſh Mr. William, *Whitechapel*
Monkhouſe Mr. George, *Strand*
Monro John, M. D. *Bedford-ſquare*
Montolieu Lewis, Eſq. *Lower Groſvenor-ſtreet*
* Montagu Mrs. Elizabeth, *Portman-ſquare*
Moore Thomas, Eſq. *Chiſwell-ſtreet*
Morris Robert, Eſq. *Swanſea, Glamorganſhire*
Mortimer Thomas, Eſq. *Park-ſtreet*
Moſeley Benjamin, M.D. *Cecil-ſtreet, Strand*
Moſer Mr. John, *Berwick-ſtreet*
Mucklow Horace, Eſq. *Iſlington*
P Muilman Peter, Eſq. *King ſtreet, Covent-garden*

## N

P Norfolk Charles, Duke of, F.R. and A.S.
**Northumberland Hugh, Duke of, V.P. F.R.S.
North Frederick, Lord, M.P.
Nairne Mr. Edward, F.R.S. *Cornhill*
P Newton Andrew, Eſq. *Cecil ſtreet, Strand*
Nicholas Robert, Eſq. M.P. *Aſhton Krynes, Wilts.*
Nickalls Mr. Joſeph, *Southwark*

Oſſory

## O

P Offory John, Earl of Upper, M.P. F.R.S.
Ogilvie Scroope, Esq. *Pall-Mall*
Oldham Mr. James, *Brook-street, Holborn*
Ommeney Capt. Cornthwaite, *Milbank, Westminster*
Ord John, Esq. M.P. F.R.S. *Lincoln's-Inn-fields*
P Oswald James, Esq. *Albemarle-street*
Owen Reverend John, *Laytonstone, Essex*

## P

**Portland William Henry, Duke of, F.R. and A.S.
Plymouth Otho, Earl of, F.R.S.
**Percy Hugh, Earl, V.P.
P Percy Algernon, Lord, M.P.
* Pusey Honourable Philip, *Upper Brook-street*
Palk Sir Robert, Bart. M.P. *Bruton-street*
* Pocock Sir George, K.B. Admiral of the Blue,
*Charles-street, Berkley-square*
P Paice Mr. Joseph, *Bread-street-hill*
Page Francis, Esq. M.P. *Aston, Oxfordshire*
Papworth Mr. John, *Wells-street, Oxford-Road*
Parker Mr. William, *Fleet-street*

Parker

Parker David, Eſq.

Parker Mr. Samuel, *Earl-ſtreet, Blackfriars*

Pariſh John, Eſq. *Fludyer-ſtreet*

Parry William, Eſq. *Norton-Hall, Wiltſhire*

Parkyns Thomas Boothby, Eſq. M.P. *Albemarle-ſtr.*

Payne Mr. Samuel, *Vauxhall*

Pearſon George, M.D. *Leiceſter-Fields*

P Perrin William Philip, Eſq. F.R. and A.S. *Bloomſbury-ſquare*

Perry John, Eſq. *Blackwall*

Phillips Mr. Samuel, *St. George's Road, Blackfriars-bridge*

P Pinfold Charles, Eſq. LL.D.

Pitt William Morton, Eſq. M.P. *Bolton-ſtreet*

Pocock William, Eſq. *Devonſhire-ſtreet, Red-lion ſquare*

P Potter Chriſtopher, Eſq.

Potter George, Eſq.

Pourcin Mr. Joſeph, *Taviſtock-ſtreet*

Powney Henry, Eſq. *Tooke's-court*

P Prado Samuel, Eſq.

Pratt John, Eſq. *Lower Brook-ſtreet*

Preſton Robert, Eſq. M.P. *Woodford, Eſſex*

Proby

Proby Charles, junior, Eſq. *Inner Temple*
Pugh Mr. David, *Hereford*

## Q

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